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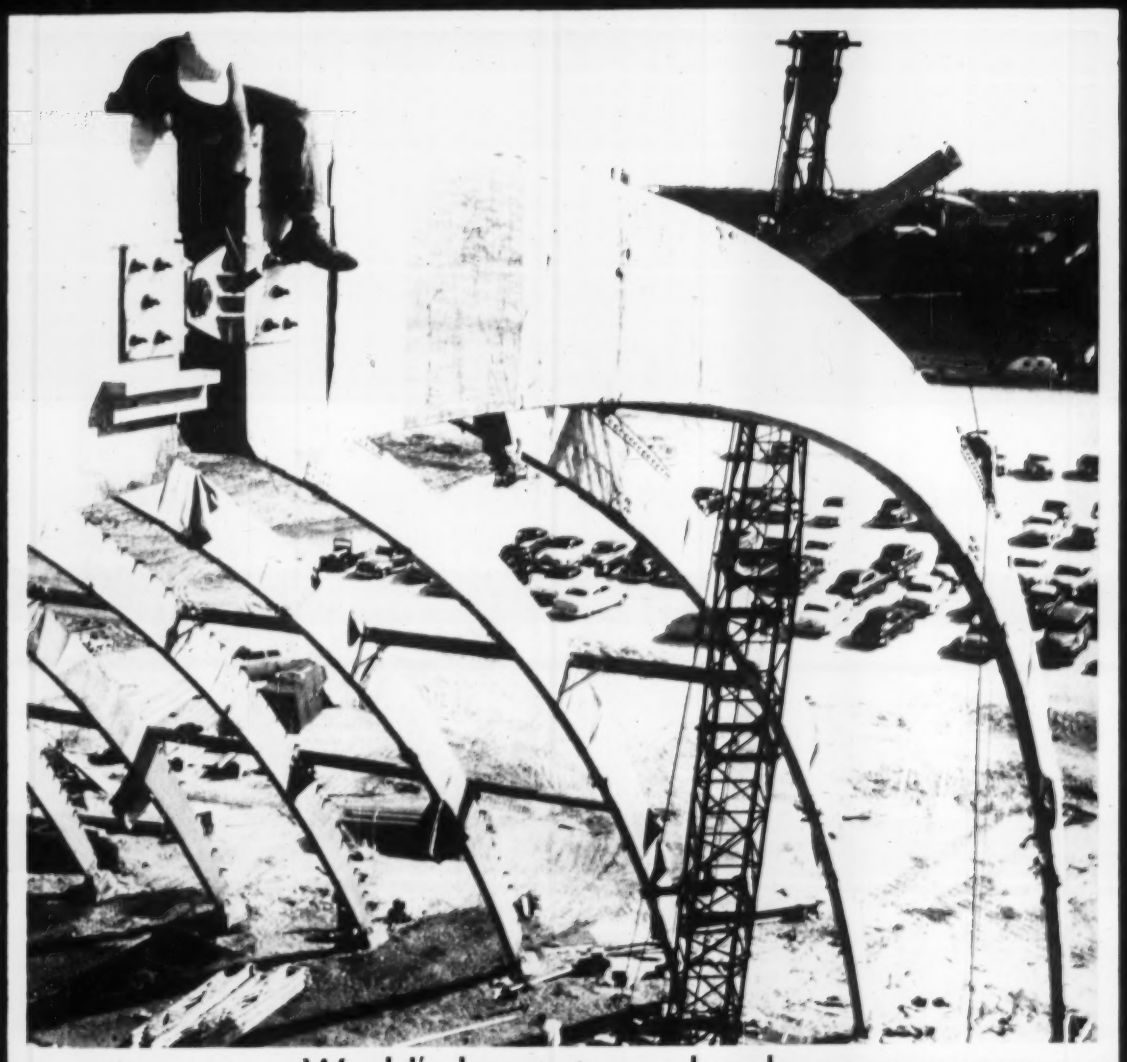

World's longest wood arches span arena p. 38

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This unique fabricating—and erecting job illustrates the ability of CB&I to furnish all types of steel plate structures, in both standard and special designs, to meet the most exacting requirements.

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WEST WARWICK, R. I.—The Kent County Water Authority is owner of this 1,000,000-gal welded-steel reservoir which was put into service in 1955. The tank measures 52 ft in height by 58 ft in diameter. General contractor for the job was General Engineering & Contracting Co.; engineer was Charles A. Maguire & Associates.

AKRON, O.—A Bethlehem erection crew completed this attractive, 1,500,000-gal standpipe during the summer of 1955. Standing 115 ft high by 47 ft in diameter, it has an elliptical self-supporting roof and is dressed up with an ornamental cornice. Engineering was by the Bureau of Water Supply, W. R. LaDue, Chief Engineer and Superintendent.

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Welded steel tanks have many advantages for the storage of water above ground. They can be made permanently watertight; they are unaffected by climatic changes; they withstand damage due to shock, impact, explosion or surface settlement; they require little maintenance, and often cost less than competitive types of storage.

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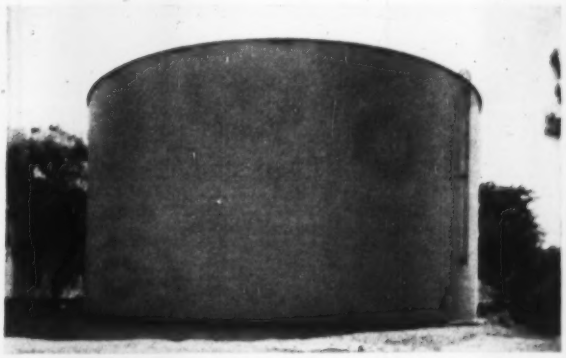

ROCHESTER, N. Y.—This 1,500,000-gal welded steel reservoir was built for the New York Water Service Corporation, which engineered the job. It is 40 ft high by 80 ft in diameter.

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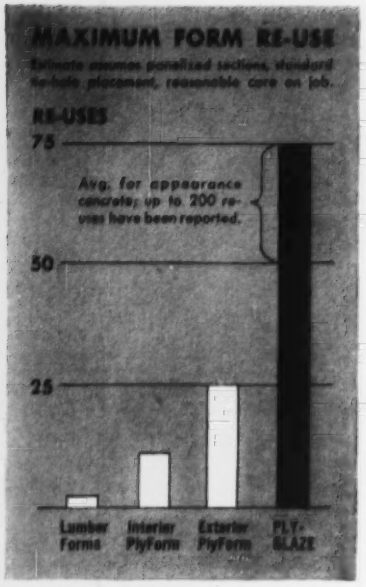

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Model 543. No machine or method can equal the low cost loading of this Barber-Greene loader. High travel speed, high capacity and finger tip discharge control save job time, man time, truck time.

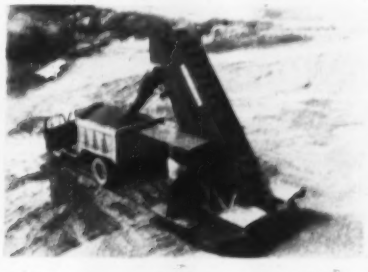
Cut loading costs the continuous way

In a Massachusetts sand and gravel pit, a Barber-Greene Model 543 Bucket Loader handles 900 tons of ¾" stone every day—easily tops all other methods in truck loading operations.

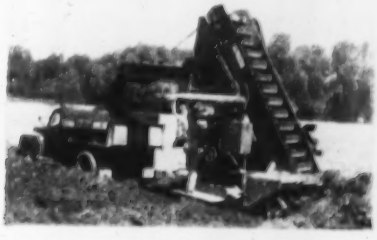
The 543 is ideal for the all-day-long loading operations of one truck after another because its continuous flow maintains maximum capacity regardless of the skill or zeal of the operator.

Its simple operation makes it easy for drivers to load their own trucks. A hydraulically controlled swivel conveyor has the reach to load highest and longest trucks and trim the load to full capacity every time. And this versatile loader can be easily converted into a coal, snow or leaf loader.

Model 550 removes windrows in a hurry . . . with a capacity that keeps ahead of all trucks normally available. This light, highly maneuverable machine reduces windrow loading to lowest cost. Self-propelled at 10 m.p.h., with a turning radius of 8' 6".



Model 82A moves 1200 yards in 8 hours. That's the record of a Barber-Greene in a New York building and supply yard. Handles sand, stone, coal and other materials at high capacities. Easy operation permits driver to load his own truck.



Model 582 speeds topsoil stripping. Crawler mounted for sure footing on all soft bases, and equipped with a hydraulic swivel conveyor, the 582 is the fast, profitable way to load from stockpile, windrow or bank or to make light excavations.

56-38L

Write for literature on any loader in the Barber-Greene line

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You can get GM Detroit Diesel power in practically every kind of construction equipment—*it's America's first choice Diesel.*

Call in your local GM Detroit Diesel distributor or dealer for full details on GM Detroit Diesel power. Do it soon—it can mean the difference between profit and loss on your next contract.

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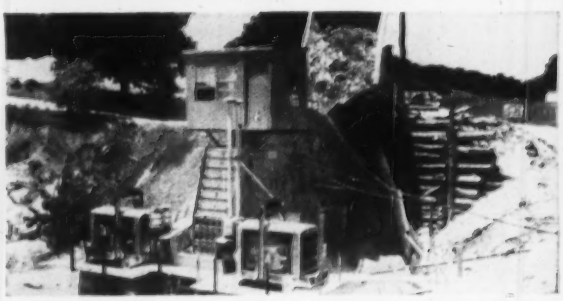
America's Largest Builder of Diesel Engines

15,000 HOURS—ONLY $150 FOR REPAIRS

Excavating Contractor Russell F. Davis of Lafayette, Indiana, put this GM Detroit Diesel-powered Northwest 25 in service in 1947, has spent only $150 for repairs since. Now company owns three more excavators—all powered with quick-starting, fast-working GM Detroit Diesels.



"WE'VE STANDARDIZED ON GM DETROIT DIESEL"

Dependability, fast service, interchangeable parts—these are some of the reasons why Pennsylvania contractor, John S. Teeter & Sons, Inc., has standardized on GM Detroit Diesel power for crushers, pumps, generators and self-powered machinery.

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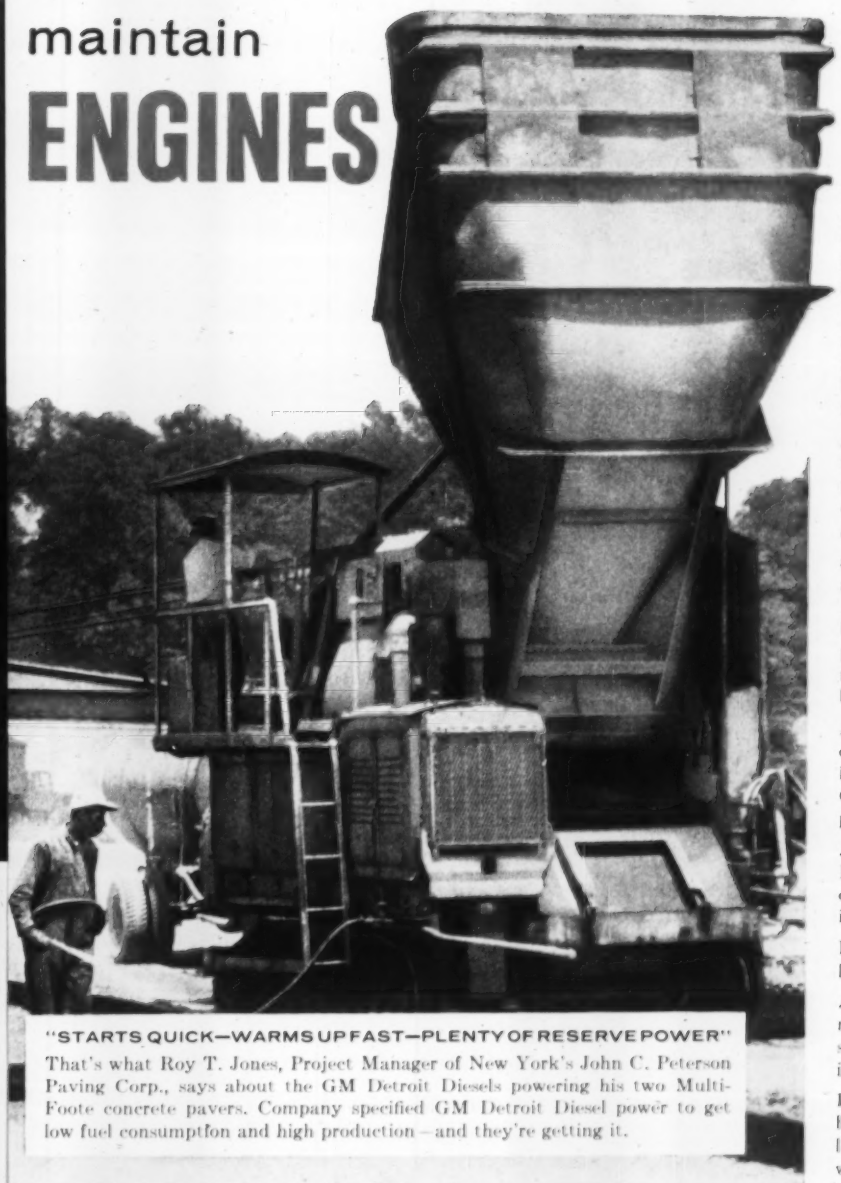


"STARTS QUICK—WARMS UP FAST—PLENTY OF RESERVE POWER"

That's what Roy T. Jones, Project Manager of New York's John C. Peterson Paving Corp., says about the GM Detroit Diesels powering his two Multi-Foote concrete pavers. Company specified GM Detroit Diesel power to get low fuel consumption and high production—and they're getting it.

Parts and Service

As Near as Your Telephone

Wherever your contracts take you, you'll find General Motors Detroit Diesel distributors and dealers ready to give you fast service and quick delivery of low-cost factory-engineered parts day or night.

For 165 GM Detroit Diesel distributors and dealers blanket the nation—still more are located in Canada and overseas—to help you keep your GM Detroit Diesels running right.

And when you call you get action, for these distributors and dealers know the need for speed on construction jobs—completion dates don't wait.

Typical of this speed is the experience of a contractor in West Virginia. He needed an engine overhaul on a scraper. His Detroit Diesel distributor had his scraper back on the job in two hours—because he pulled the engine and replaced it with a rebuilt unit, then took the original engine back to his shop for overhaul.

Another contractor hit subsurface water on an excavation—and his distributor kept the contract going by delivering GM Detroit Diesel-powered Wellpoint pumps in less than half a day.

And when you put your GM Detroit Diesel in the hands of your distributor's or dealer's servicemen, you're putting it in the hands of experts.

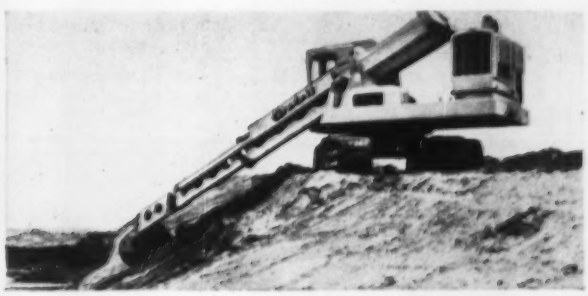
For they're factory-trained, know all the latest maintenance and repair procedures.

And they use factory-engineered replacement parts—the same parts, built to the same rigid specifications as the parts used in building GM Detroit Diesel engines.

For full details on the parts and service behind your GM Detroit Diesel, call your local GM Detroit Diesel distributor or write direct.

CRUSHES 280 TONS ON 90¢ FOR FUEL

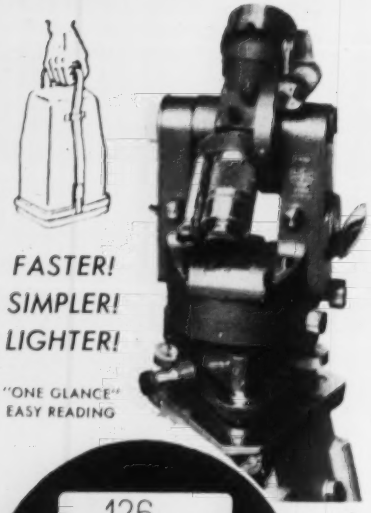
Minnesota gravel contractor P. O. Pederson switched from a 4-cycle Diesel to a GM Detroit 2-cycle Diesel several years ago, has specified GM Detroit Diesel in two more crushers bought since then. Company reports GM Detroit Diesels start easy, work fast.



WINS $1,143,835 JOB WITH GM DIESEL UNIT

This GM Detroit Diesel-powered Gradall's ability to do a faster job at less cost helped an Illinois contractor win a big contract in Oklahoma. In 400 days he cleared and grubbed 2,493,000 yards to widen and straighten a river and stabilize its banks.

LOOK!



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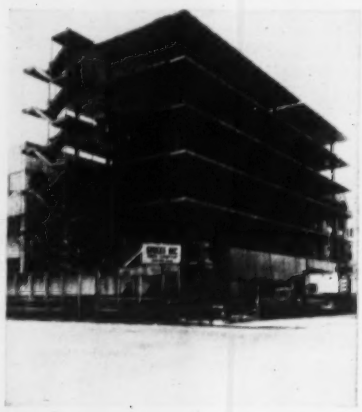

Lift-Slabs Go Still Higher

SIR—With reference to the interesting article, "Lift-Slab Job Goes Up Six Stories" (ENR Feb. 2, p. 43), we submit information on still another tall lift-slab structure, and it would appear, a new height record for lift-slab construction.

The new jail building, built for the County of Sacramento, Calif., at Seventh and H St., Sacramento, has a total height slightly in excess of 70 ft, measured from the top of the ground floor to the finished surface of the roof—the uppermost of the six slabs raised.

The building is 125 ft in length, with a width of 59 ft 3 in. in the first two stories and of 46 ft 2 in. in the four upper stories. In addition, a projecting area of 25 ft 8 in. x 29 ft extends through the full height and is integral with the adjoining slab area. The four upper slabs were lifted in two sections—one on 12 and the other on 11 columns—each 10 in. square, fabricated from plates. The two lower slabs were lifted in three sections on 8, 8 and 12 columns respectively. The concrete slabs were uniformly 9 in. thick and the spans relatively short; thus deflections were minimized and permanent secure anchorage of cell units assured.

The slab lifting was accomplished in three phases, providing for fixing two slab sections at final elevation in each phase and requiring two column-splicing operations. Bracing was provided and checks made for accuracy of vertical alignment in each phase, through no divergence greater than ¼ in. occurred.

The undersigned executed the lifting subcontract, using equipment and methods developed for specialized work in this field, featuring an electronic control panel and other distinctive items. The electronic control panel automatically keeps slab elevations at all columns within ¼ in. of the mean, and eliminates continual monitoring. A valuable safety device is an automatic shut-off, which operates to prevent overload on any jack.

Each 50-ton hydraulic jack has its own pumping unit and oil reservoir, eliminating high-pressure hydraulic lines and the oil-leakage nuisance. The hydraulic ram is actuated by an air motor, supplied with air from a portable compressor. Spooled lifting rods connect with the encased lifting collars in the slab. These rods are in 5-ft sections, which can be readily uncoupled as they pass through the jack. Final adjustments can be made simply and exactly. Through telephone communication with an observer below the slab, the control panel operator can raise or lower the slab ¼ in. by a flip of a switch.

Contract price for the lift-slab jail is $1.6 million. Harry J. Devine is the architect and Ernest D. Francis, the structural engineer, both of Sacramento. The general contractor is Stolte, Inc. of Oakland, Calif.

ALLAN H. STUBBS
EDWARD K. RICE
Western Concrete Structures Co.
Hollywood, Calif.

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

More Engineering Students

SIR—Congratulations on your excellent editorial "Confusing the Issue" (ENR March 1, 1956 p. 100).

May I add a thought on the subject of "how to interest more young people in engineering and scientific careers". It is a tremendous job and should not be left to the educators and business men alone.

Every professional engineer and scientist must consider it his duty to the country and profession to help steer our young men toward an engineering or scientific career. He must get in touch with the high school in his community, talk to the students. He should take them to visit his office, plant or laboratory, lessen their fears

VISIBILITY

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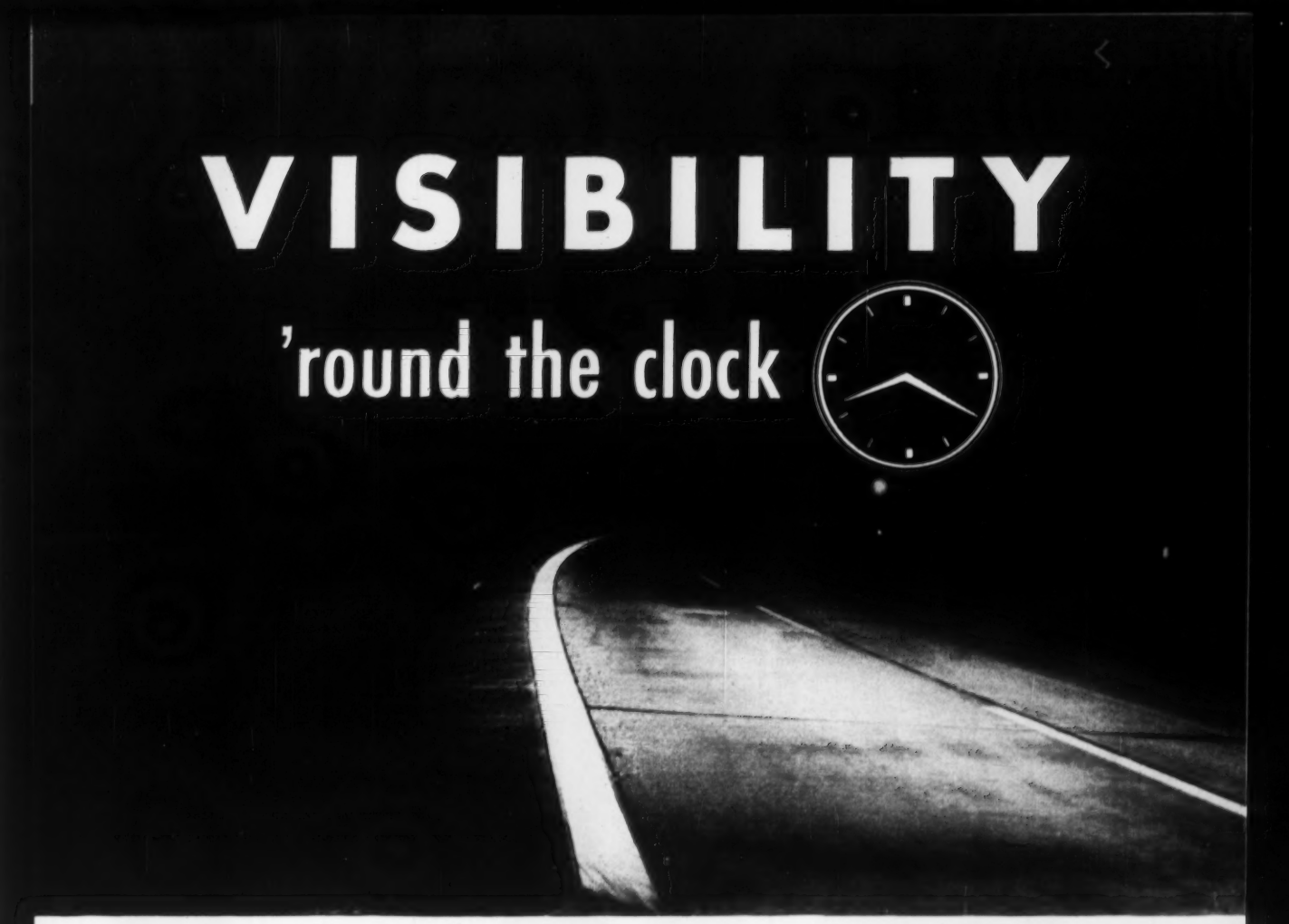

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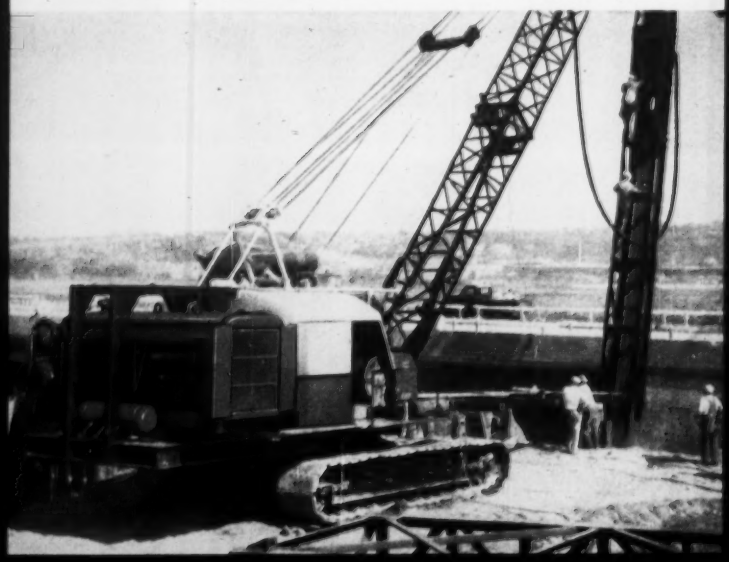

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There's nothing like this 365 cu. ft. CP Rotary compressor for excavation and highway construction. Here it supplies air for the simultaneous operation of a pair of G-150 Wagon Drills and their powerful 3-inch Drifters.

Chicago Pneumatic "Power Vane" Rotaries take the beatings of continuous heavy duty service under all conditions with an absolute minimum of attention. For really big jobs, there's nothing that approaches the performance of the "Power Vane" 900 — the *only* 900 cu. ft. compressor that has proven itself in pipe line testing, pile driving, and caisson jetting. "Power Vane" Rotaries are also available in 600, 365, 210 and 125 cu. ft. models. For more details, see your CP equipment distributor.

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This battery of 600 cu. ft. "Power Vane" Rotaries supply all the air required to maintain schedules for pile driving and jetting.

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. . . Reader Comment

of the hard work ahead, describe the rewards. He may contact his professional society or association for advice or literature, but the initiative and work must be his own.

I think that if every professional engineer and scientist succeeds in "saving" the career of even one student, the supply of engineers and scientists in this country will be adequate.

A. G. Lichtenstein,
Leonia, New Jersey

Sir—In your editorial "Confusing the Issue" (ENR Mar. 1, 1956, p. 100), it seems to me that your point, as expressed in the first paragraph and especially in the last sentence, is extremely well taken and succinctly stated. I have not seen, in any of the numerous articles that have appeared recently in newspapers, magazines, and even in professional journals, indication of the understanding of the real perspective of the problem that you show in this brief editorial. I hope that this will serve to establish the problem on its proper basis—without which, no sound and realistic solution seems likely to be attained.

If I may comment briefly on the thought expressed in your last paragraph, it seems to me that one of our difficulties actually is exemplified in the fact that the "heroes" of boys in grade and high school—and to a large extent in universities as well—are the men and women who have attained outstanding success in sports and other forms of public entertainment. This is in spite of the fact that those whose achievements they study in school are the statesmen and professional people who have made major contributions to the growth and welfare of our country.

It seems to me that the choice of a life's work is not really a snap decision made near the end of the senior year in high school, however much and however frequently it may appear to be so. I believe that this choice is the cumulative result of the influences that have existed in the home and community life of the individual. These influences do not seem often to instill in the youth sufficient understanding of, and admiration for, the achievements of our scientists and engineers to impel them to follow such careers for themselves—and especially to prepare themselves in the first 12 grades by studying the mathematics and science courses needed as a proper foundation for serious study in these fields at the college level. I think most teachers would admit that it is lack of interest rather than any real

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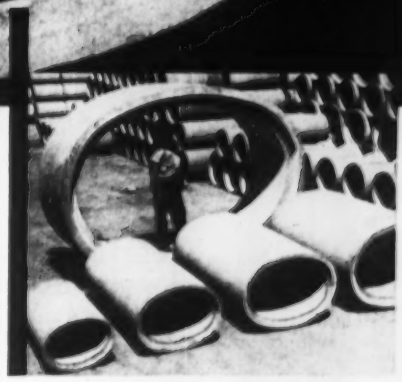

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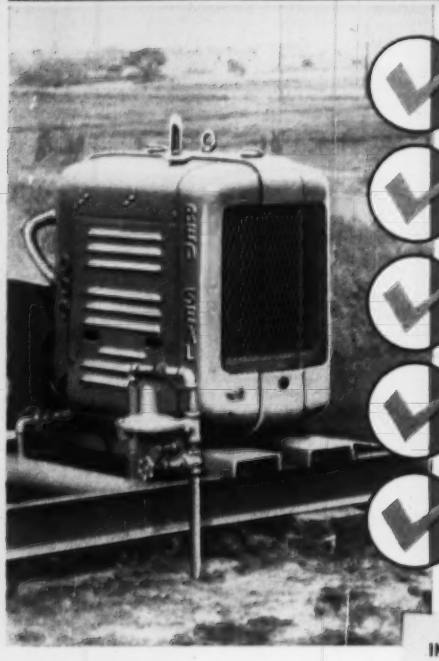

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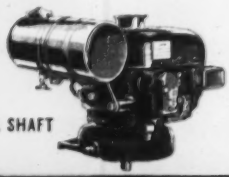

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difficulty of subject matters, that causes such a high proportion of high school students to avoid mathematics and science in favor of "snap" courses.

I do not pretend to know the answer, but do not see how we can expect to find an adequate one until this aspect of the problem is recognized and thoroughly explored.

C. L. Strain Radm. (CEC), USN
Director, Atlantic Division
Bureau of Yards and Docks
New York, N. Y.

Too Much Desocialization

Sir—The cry of socialism that rises from your reader (ENR Dec. 8, 1955, p. 10) concerning Minneapolis road repairing is indeed hard to comprehend, though to this reader it appears to be direct quotes from the well organized (and well heeled) campaign which is part of the current scene and whose theme is that anything municipally, state or federally owned is evil and should be sold for ten cents on the dollar to the nearest private enterprise "saviour."

From this have come giveaway tidelands, oil leases on game refuges, Dixon-Yates curtailment of TVA—the list is rather long.

No, I think that even some of our dullest witted citizens are beginning to have doubts as to who benefits and who loses as we are "desocialized."

Colin C. Harris
Assistant Engineer
New Jersey Highway Department
Butler, N. J.

Place Joints Over Columns

Sir—I read with interest your analysis of the warehouse failures (ENR Jan. 12, p. 21). It appears to me that the expansion joints could have been placed over the supporting columns.

Then, the different sections of the main girders would be simple beams dowelled or otherwise secured in alignment. It might be necessary to make the columns larger at the top so that the bearing at this intersection would be greater in area. The girders should be tied in such a manner as not to develop a bending moment at the supports. They should, however, be secured to prevent too great a variation in the joint width.

The amount of steel required for the present design is greater than would be necessary for girders where the expansion joints are placed over columns.

It also seems to me that the depth should have been 48 in., 15 in. greater than it now is. The girders should

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Opening at bottom	2 ft. 7 in.
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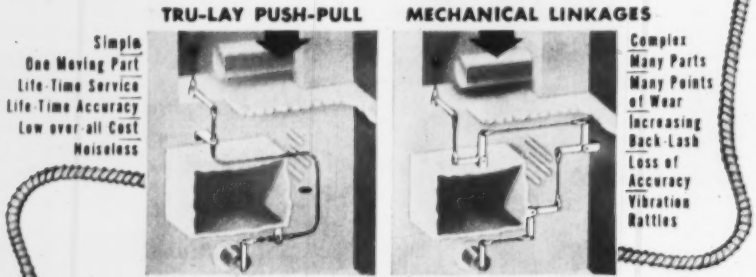

TRU-LAY *flexible* PUSH-PULLS are dependable and accurate even under the most adverse conditions. They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual elimination of maintenance.

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. . . Reader Comment

be set with a spacing of 12 to 16 ft and tied in position longitudinally with purlins secured to the top surface and space to accommodate the roof covering.

G. L. BILDERBECK
Consulting Engineer
Groton, Conn.

Largest Warehouse

SIR—On page 96 of your Feb. 16, 1956 issue, you state that the largest single-story warehouse in the world was completed at Palmdale, Calif., for the U. S. Air Force.

Knowing your desire for accuracy, I would like to point out that a larger warehouse was completed on the outskirts of Toronto in 1952 for the Royal Canadian Air Force. The dimensions of this reinforced concrete warehouse are 1480 x 560 ft, as compared to the 1000 x 500 ft for the structural steel warehouse at Palmdale.

The designing engineers were Margison Babcock and Associates Limited. The contractor was Geo. Hardy Ltd., of Toronto.

A. D. McKEE
Vice President
B. Perini & Sons Canada Ltd.
Toronto, Canada

CALENDAR

American Institute of Steel Construction, Eighth Annual National Engineering Conference, Lehigh University, Bethlehem, Pa., April 4-6.

Western Association State Highway Officials Conference, Phoenix, Ariz., April 10, 11, 12, 13.

Construction Specifications Institute, ninth annual meeting, Architectural League, New York, N. Y., April 19.

Society of American Military Engineers, 36th annual meeting, Washington, D. C., May 14-15.

Purdue Industrial Waste Conference, Purdue Memorial Union, Lafayette, Ind., May 15-17.

American Institute of Architects, annual convention, Biltmore Hotel, Los Angeles, Calif., May 15-18.

Prestressed Concrete Institute, second annual convention, Hollywood Beach Hotel, Hollywood, Fla., May 16-18.

Society for Experimental Stress Analysis, spring meeting, William Penn Hotel, Pittsburgh, Pa., May 16-18.

Building Research Institute, annual meeting, Sheraton-Brock Hotel, Niagara Falls, Ont., May 21-22.

National Society of Professional Engineers, Ambassador Hotel, Atlantic City, N. J., May 23-26.

Materials Handling Exposition, Cleveland, Ohio, June 5-8.

World Conference on Earthquake Engineering, University of California, Berkeley, June 12-16.

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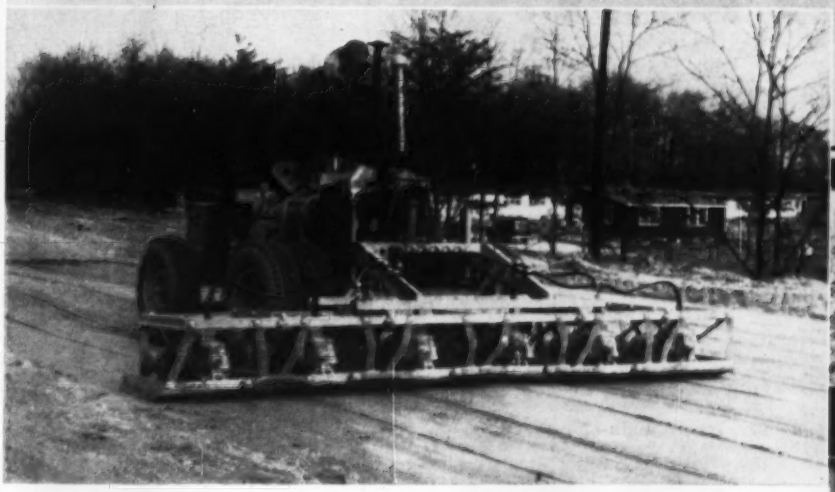

6 COMPACTING UNITS IN WORK-HEAD for maximum productivity in straight-away work. Left: Compacting sand fill in a bridge approach . . . another phase of its wide range utility to paving contractors.

4 COMPACTING UNITS just fit this widening job-change required in only a few minutes.

3 COMPACTING UNITS in tandem and staggered, suits this job ideally — a quick and easy change.

1 COMPACTING UNIT fitted with operating handle and narrow base. Just right for the otherwise unreachable spots.

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For consolidating granular soil sub-bases and the base courses of sand, gravel, rock or slag in waterbound and penetration macadam construction, there is just nothing that compares with the Jackson Vibratory Multiple Compactor. It not only does the straight-away work in only half the time required by equipment of other types, but is so versatile, so easily adaptable on the job that it can be used to great advantage for widening projects of any width and getting into places other equipment can not touch. As may be noted in the illustrations, any number of compacting units may be used in the workhead (up to 6, which covers 13', 3") to exactly fit the job at hand. Units may be towed at the side or fitted with operating handles and used as individual, self-propelling compactors. Quickly interchangeable bases from 12" to 26" are also available for compacting in trenches, etc.

For compacting granular soil fills of all kinds, the Jackson Multiple Compactor is a terrific cost saver and progress expediter. *It's the predominant medium of consolidation used on the outstanding paving jobs in the country today.* See your Jackson distributor for complete details. We will gladly furnish his name, and literature on request.

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Only when the perfect pipe is invented.

The dream pipe for which all engineers pray would be light as a feather, indestructible, pliable enough to bend around obstructions, and would be installed by a magical machine that digs the trench and extrudes, lays and backfills the pipe.

Needless to say, this will be in the far distant future. Until such a dream pipe is invented, water works officials and engineers are specifying the next best pipe—LOCK JOINT CONCRETE PRESSURE PIPE. It comes the closest to realizing their ideal specifications: long life at top carrying capacity because it never corrodes nor tuberculates; great strength to withstand internal pressure and exterior loading; versatility to meet the most difficult laying conditions, and minimum maintenance requirements over the years.

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

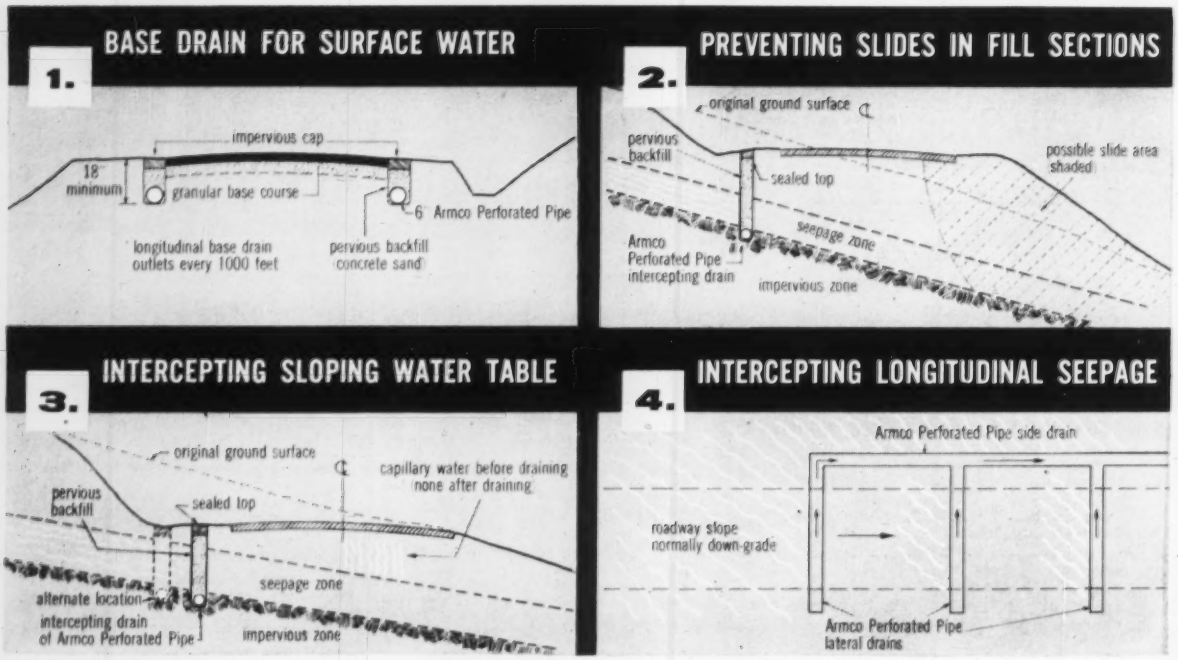
RECORD CONCRETE GIRDER—Precast, prestressed concrete girders of record size were successfully erected last week for a hangar at Hill Air Force Base in Ogden, Utah. The 10 units are 136 ft long and weigh 84 tons each. Three cranes teamed to make the lift after which the girders were pulled to final position along rails mounted on spandrel beams. Contractor for the Corps of Engineers job is Jacobsen Construction Co. of Salt Lake City.

LONGEST PLATE GIRDER SPAN—A Connecticut Turnpike bridge now under construction over Quinnipiac River will set a new U. S. record. The three-span continuous-riveted plate-girder bridge will have a center span of 387 ft and two side spans of 258 ft. The center span will exceed by 12 ft the main spans of the New Jersey Turnpike bridges across the Hackensack and Passaic Rivers, which now hold the U. S. record (ENR Jan. 17, 1952, p. 30). To keep flanges to a reasonible size, more girders than usual will support the deck and they will be made of low alloy steel. The girders will be 21½ ft maximum depth over the abutments and 12½ ft at the center. Contractors are William L. More Building Corp. and Lopier Construction Co., both of New York. Bethlehem Steel Co. will fabricate and erect the steel.

MORE DOUBTS ABOUT TURNPIKES—As the federal highway aid bill nudges forward in Congress, doubts about future turnpike projects mount. Though his state's toll road ventures have turned out well, New Jersey's Gov. Robert Meyner is another to go on record as doubting that any new ones should be built. Toll roads, the governor told a press conference, are in the long run more expensive to build and operate than free ones—and the authorities created to run them tend to become unmanageable "super-states." And, on the other side of the country, Seattle's Mayor Allan Pomeroy recently urged a re-evaluation of Washington State's proposed Seattle-Tacoma-Everett toll highway to see if it couldn't be built as a free road.

CORPORATION PRACTICE BILL DIES—The Milmoe Bill, 1956 version of perennial attempts to change New York's state education law, died in the closing hours of the legislature last week. Grass roots action of professional groups this year succeeded in defeating the bill, an attempt to legalize practice of engineering by corporations.

KRUPP IN CAIRO—Herr Alfred Krupp, the West German industrialist, completed a five-day visit to Egypt by announcing that his firm would bid on construction of Aswan High Dam. The Krupp Works is making a big play for business in underdeveloped countries of Africa and Southeast Asia.



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Armco Perforated Pipe* provides the efficient, economical way to remove destructive ground water from highway foundations. It stabilizes roadbeds once and for all. It eliminates repeated repair and rough, patched highways.

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ARMCO PERFORATED PIPE

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WASHINGTON OBSERVER

Another extension of GI home-buying privileges now looks less certain. For the last year or so, builders, lenders, and veterans organizations have been keeping an eye on a deadline that's coming up in July of next year for veterans of World War II.

An expiration of GI rights could close off a big potential market. It's estimated that some 11,000,000 veterans would lose their rights to a low-down-payment home and 30-year maturity on the mortgage. This GI program has accounted for about one-third of all housing starts in the last year.

No one knows for sure how many GIs would be frozen out, but VA officials and others guess privately that such a cut-off might close out a million home sales, perhaps more.

Officials do say, however, that a big rush to beat the deadline is sure to come unless Congress extends it. Homebuilders and lenders say the rush would be far beyond their capacity to handle. They want to know now whether to get ready for it.

The Administration may be reversing its stand. Eisenhower in his Budget Message said he wanted to let these rights die in July 1957 but VA officials and Congressional leaders say they've heard that the Administration is preparing a plan which would call for a gradual tapering off rather than a hard expiration date.

However, there's opposition from chairman Teague of the House Committee on Veterans Affairs. Teague and some of his committee members say that discounting of GI mortgages and shoddy work by homebuilders indicate to them that the program needs a lot of cleaning up before they are ready to vote an extension. This may be enough to hold off a vote on the extension until next year.

•

Shortage of raw land for suburban housing development is a more critical problem than even many of the experts realized. **The big difficulty is that new public facilities push new home costs** out of the range of the biggest market—that is, those who can buy houses in the $10,000-$12,000 bracket. The growing trend has been to make the subdividers tack the cost of streets, sewers, water, and the like onto the cost of the new homes being built.

Homebuilders contend these are community costs that should be borne by the community as a whole instead of by the new home buyer.

National Association of Home Builders hasn't been able to find an expert to head a staff that would dig into this problem.

•

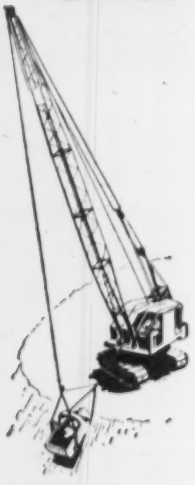
Building trades unions are lobbying for a change in Taft-Hartley union security limitations despite a refusal by the AFL-CIO Executive Council to approve such a drive. And the building trades' decision to go ahead has aroused the wrath of the AFL-CIO's Industrial Union Department. Attempts are being made to work out the conflict.

At the objection of industrial unions the Executive Council, at its recent Miami meeting, turned down the building trades' request for support of a proposed amendment to permit pre-hire construction contracts, where employes would be required to join a craft union after seven days on the job, as compared with the law's present 30-day requirement.

Industrial unions object that the proposed amendment, as written, might freeze their members out of plant maintenance work. This hassle is an extension of the perpetual dispute between the two groups over plant construction and maintenance work.

Shovel-Crane owners!

sharing your profits with old-fashioned clutches?



Remember the day the weather was fine, footing good and the haulers were really rolling...

THAT was the day you thought the job was going to move out ahead of schedule. But the clutches were getting hotter all the time. By mid-morning the dragline went down for clutch adjustment—the heat had done it. After the noon break, the same thing happened. How much production do you figure you were penalized for having a rig with old-fashioned clutches?

Avoid costly downtime

With a Link-Belt Speeder you get modern power, hydraulic-actuated clutches that automatically compensate for heat and normal lining wear. In fact, most Link-Belt Speeder owners will tell you these clutches are so good, adjustment is needed only once or twice a month.

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Get the complete story from your distributor. He'll show that whatever rigs you need—crawler or rubber-tired . . . ½ to 3-yd. 8 to 60-ton capacity—you'll earn bigger return on your equipment dollars with a Link-Belt Speeder. Or write for literature—LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

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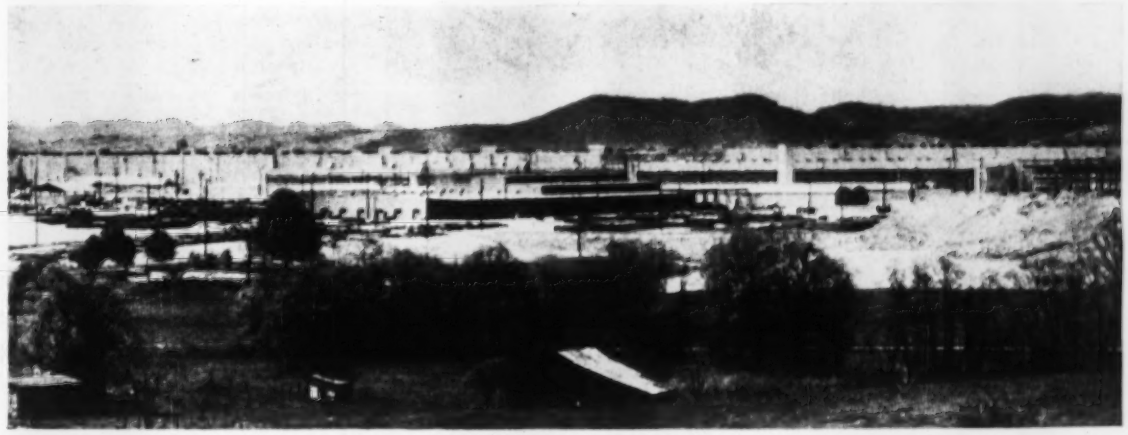


As its huge $1.2-billion plant goes into operation at Portsmouth, Ohio . . .

AEC Reports Construction Costs Cut 33%

Months ahead of schedule, the Atomic Energy Commission's gaseous diffusion plant at Portsmouth, Ohio, has been placed in full operation. Despite the "crash" program, actual construction cost of the project is $400 million under the preliminary estimate of $1.2 billion.

The plant will produce fissionable uranium (U235), a fuel for nuclear reactors. This light isotope of uranium will be separated from the heavier, more abundant element (U238) by passing uranium compounds in gaseous form through a long series of membranes and taking advantage of the slight difference in weight. The process building is about one-half mile long.

Total floor area in the several buildings comprising the project is about 9,000,000 sq ft (ENR March 4, 1954, p. 36). In addition, a 46-mi four-lane divided highway was constructed between Chillicothe and Portsmouth to serve the plant, which occupies a 3,700 acre site 80 mi east of Cincinnati.

S. R. Sapirie, manager of AEC Oak Ridge operations, lists the following as some of the major factors in reducing cost of the plant:

• Improvements in construction methods through interchange of ideas between contractor participants on gaseous diffusion construction at three projects—Portsmouth, Paducah and Oak Ridge.

• Substantially lower costs of materials and equipment resulting from stabilization of the materials market, keen competition in bidding by subcontractors and reduction in unit cost of tooling up for the specialized equipment, because of the large amount required. Savings achieved through lower costs of materials and equipment at Portsmouth were about $170 million.

• Utilization of construction equipment and materials that already had been used on other AEC construction jobs.

• Savings in labor costs alone, estimated at more than $196 million. These resulted from a shorter construction period and more even distribution of the labor forces than originally contemplated. Peak employment was reduced from 30,000 to about 20,500. The excellent cooperation that existed between labor and management resulted in few work stoppages and contributed substantially to savings on labor.

• Improvement in over-all economic conditions in the construction industry throughout the country during the period 1952-1954.

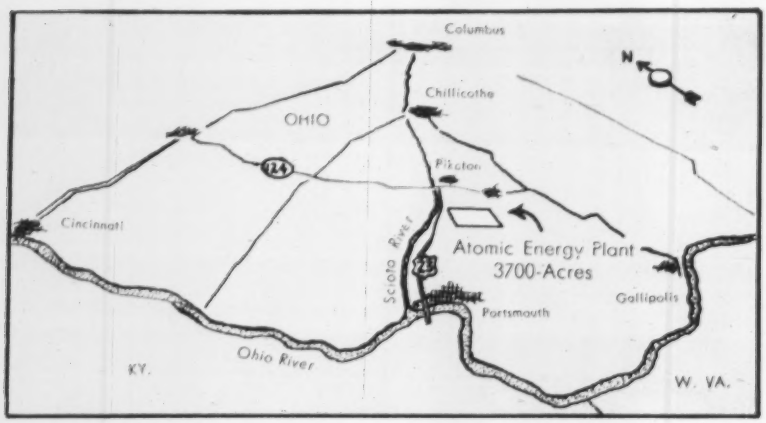
Kenneth A. Dunbar, formerly in charge of the AEC plant at Paducah, Ky., is the AEC manager of the Portsmouth area.

Peter Kiewit Sons' Co., Omaha, is the principal construction contractor, under a cost-plus-fixed-fee contract. George C. Holling is project manager. The project was designed by nine architect-engineering firms (ENR Aug. 21, 1952, p. 21 and Sept. 11, 1952, p. 71).

PETER KIEWIT—"We can properly take credit only for savings that resulted from project management."

• But how realistic was the estimate?—AEC estimates for Portsmouth were based on the cost of building the smaller Paducah plant in 1951—the period of Korean War shortages and tight labor supply. Kiewit started work after material supply had eased and labor was more plentiful. In addition, as Peter Kiewit points out, the sheer size of the new plant made possible assembly-line savings through repetition and unit-cost reductions in tooling up.

Kiewit says that his firm can properly take credit only for savings that resulted from project management. Since project management was responsible for production operations starting six months ahead of schedule, and since peak employment was reduced considerably below estimates, a great deal of credit for the construction



SITE of the U235 plant, covering 3,700 acres, is 80 mi east of Cincinnati.

savings is due the principal contractor. However, Kiewit also credits the AEC:

"One of the principal factors that enabled us to perform the project with a saving of money and time was the splendid cooperation and assistance given us by representatives of the AEC, who, through the experience they had gained from similar projects, were able to furnish us with valuable suggestions for performing the work faster and at less cost."

Steps taken by the firm to execute the project at high efficiency were outlined by Kiewit:

• "All employes hired were carecarefully screened, to obtain the best available. All supervisory employes were given special training to better qualify them to carry out their duties.

• "We made up detailed schedules on all phases of the work including procurement and construction, and set up a system of controls so that we were not only able to tell where we were in relation to the schedule but also to anticipate and eliminate delays.

• "The majority of the work subcontracted was awarded on a competitive bid basis. All work whether performed by us or by subcontractors was closely coordinated to avoid interference between the various contractors. Equipment and materials procured for the project were purchased on competitive bids to the maximum extent.

• "We negotiated project labor agreements with the various construction unions and set up a labor relations department that was responsible for seeing that management as well as the union complied with these agreements. Because of the cooperation given us by the unions, grievances and work stoppages were kept to a minimum.

• "We established a project safety policy and set up a safety department to carry out this policy. All employes from the day of hiring were given regular safety training. This safety program resulted in the best safety record ever obtained on a similar project."

• **Operation savings, too**—Considerable savings also have been effected in the operation of the new plant, Sapiric says, as a result of increased efficiency of plant equipment with reduced maintenance requirements and additional improved instrumentation permitting use of less manpower. (The project will be operated by Goodyear Atomic Corp., a subsidiary of Goodyear Tire and Rubber Co., Akron).

Cost of electric power to AEC furthermore, will be less than estimated. Philip Sporn, president, Ohio Valley Electric Corp., announced last week that power facilities to serve the Portsmouth project have been completed ahead of schedule and at a lower cost than estimated. The facilities cost about $385 million. Included are the 1,290,000-kw Clifty Creek plant, at Madison, Ind., on the Ohio River 50 mi. downstream from Cincinnati, and the 1,075,000-kw Kyger Creek plant, on the Ohio midway between Parkersburg and Huntington, W. Va. (OVEC is a combination of 15 companies organized for the specific purpose of building these plants.)

Completion of the Clifty Creek plant, largest privately owned power plant, was also announced last week.

One phase of the original construction program at the Portsmouth plant still remains to be completed. This is a feeder plant to convert uranium compounds to uranium hexafluoride gas. The facility will consist of a main building with about 62,000 sq ft of floor area and two auxiliary buildings with about 6,000 and 1,680 sq ft. Construction is scheduled to get under way shortly and to be completed within 18 months.

Bridge to Nowhere

N. J. and N. Y., approve span to cost $220 million

Although still very much a bridge to nowhere, the long-held dream of a suspension bridge across New York Harbor's "narrows" moved a huge step toward reality this week.

The New Jersey state legislature, devoting an entire legislative day to the matter, completed work on a measure authorizing construction of the $220-million structure, and sent it to Gov. Robert Meyner for his already-announced approval. Similar legislation has already cleared the New York legislature at Albany.

Two-state approval is necessary, since the structure—although entirely within the boundaries of New York City—will be financed and built by the bi-state Port of New York Authority.

The "nowhere" phase of this planned structure arises from the fact that the enabling legislation specifically deals only with the bridge itself, and just as specifically leaves to the state (in this case, New York) and federal authorities the responsibility of building the necessary approaches. And at the moment, at least, there are no funds or provisions in sight for them to pay for this approach work.

• **World's biggest**—When built, the Narrows Bridge will have the world's longest suspension span—its 4,400-ft main span topping that of San Francisco's Golden Gate Bridge by 200 ft. According to preliminary plans prepared for the Port Authority by the New York consulting firm of Amman & Whitney, the structure would have a length of 7,200 ft, anchorage to anchorage; cable towers 700 ft high, and a clearance at mid-span of 237 ft over mean high water.

As originally proposed by PNYA (ENR Jan. 20, 1955, p. 28) the structure is to be built to carry two six-lane decks for motor traffic, but only the lower deck is to be built initially, the second deck will be added as traffic warrants.

The bridge would be the first direct connection of New York City's relatively isolated borough of Richmond (Staten Island) with the "mainland" of the city itself—in this case, with Brooklyn, on the western tip of Long Island. Through eventual connections with the existing Belt Parkway along the Brooklyn waterfront, and the Brooklyn-Battery Tunnel, it would give access to Manhattan Island and points north. And it would provide a direct by-pass of heavily congested Brooklyn, Manhattan and northern New Jersey cities such as Jersey City

and Newark, for traffic bound westward from Long Island itself.

• **Financing**—Under a novel financing plan, the enabling legislation provides that the financing of the structure be done by issuance of Port Authority bonds, secured by revenues from the facility.

However, as soon as the bridge is completed and ready, it will be turned over to another authority—the Triborough Bridge and Tunnel Authority—for operation. Triborough will deduct operating expenses, then turn over the remaining revenues to PNYA.

It is the hope that by 1969, Triborough's financial status will be able to purchase the structure outright, thus paying off PNYA's bondholders.

• **But where does it go?**—Uncertainty over the approaches will prevent any immediate go-ahead on construction plans, although detailed designs will now be put into work as soon as possible, PNYA officials indicated.

However, the general opinion this week was that the approach question would be settled by mid-summer. It was pointed out that the approaches would be a part of the federal interstate highway system, and there is considerable liklihood that the federal government would pay a large share of the cost. Additionally, officials looked hopefully at a $500 million road bond issue approved by the New York legislature (see p. 77), in the belief that some of that money—if approved by voters in November—could be made available.

Sewage Pact Signed

Company, community join forces to build new plant

The City Council of South Charleston, W. Va., has signed a 40-year pact with Carbide and Carbon Chemicals Co. calling for the latter to construct and operate a sewage treatment plant to handle municipal and industrial wastes.

The agreement, similar in objective to the Somerset-Raritan Valley Sewerage Authority and American Cyanamid Co. plan (ENR Mar. 22, p. 25), sets up an interesting administrative scheme.

Carbide will design and construct a complete treatment works and will receive a lump-sum amount from city to cover the latter's pro rata share of the initial cost, expected to approximate $600,000. However, the chemical company will amortize one-half of the city's bond issue over the years.

After the plant is completed, a wholly-owned Carbide subsidiary, formed for the purpose, the South Charleston Sewage Treatment Co., will operate and maintain the plant. Pro rata charges based on actual cost will be made to the contributors of Sewage-Carbide, the city and perhaps several other local industries.

Design of the plant and its operating standards must be approved by the city's Sanitary Board as well as the State Health Department and State Water Commission.

Officers of Carbide and Carbon Chemical Co., a division of Union Carbide and Carbon Corp., will staff the subsidiary company. But the South Charleston mayor and councilman will be on the board of directors.

City and company officials look to a 1958 completion date for the treatment plant. The city has been ordered by the State Water Commission to stop polluting the Kanawha River by this time.

Carbide is still conducting pilot plant studies to determine the best way to treat its industrial wastes. The final answer is expected by October, which will meet the 1958 construction schedule.

Runaway Cableway

Demolished cableway tail tower to be rebuilt soon

A cableway tail tower, demolished when it derailed and ran down an embankment during a violent windstorm Feb. 25 at Table Rock Dam, will be rebuilt by about April 1.

The cableway, one of two on the multipurpose White River project, carried an 8-cu yd bucket. The second cableway, carrying a 4-cu yd bucket, has continued the concrete pouring operation while repairs are being made.

Table Rock Dam is near Branson, Mo. The Army Corps of Engineers Little Rock District, gave this report on the tower failure:

A storm with winds 80 to 100 mph struck at 12:30 AM. The tail tower, 165 ft high and 675 tons of concrete and steel, was set in motion by the force of the winds.

The tower was blown 450 ft downstream along its level track, ran through a track-end barricade of stop logs and toppled over an embankment.

The operator reported that the braking mechanism was not sufficient against the cyclonic-force winds to halt the tower.

The tower will be rebuilt with a positive brake on the axle of the wheels instead of on the shaft of the electric drive motors (wheel brake instead of a motor brake).

Supporting legs of the head tower were buckled by the cable strain when the tail tower crashed. Some formwork was damaged slightly when the bucket dragged across. No one was injured.

Total damage was estimated at $75,000 to $150,000. Of about 600 men on the job, 140 were laid off temporarily.

The main dam construction contract for $24.4 million, held by Morrison-Knudsen Company, Inc., of Boise, Ida., and Utah Construction Company of San Francisco, awarded in October 1954, is about one-third complete. Completion is scheduled for the summer of 1958.

Total project cost will be about $68 million and completion of the entire project is set for the summer of 1959.

• **7½-ft lifts**—For the first time on a major construction project, the Army Corps of Engineers is permitting the contractor to use 7½-ft concrete lifts instead of the customary 5-ft lifts.

The option, recommended by the Little Rock District, resulted from studies during the construction of Bull Shoals Dam on the White River in Arkansas and has been in the Corps of Engineers job specifications since October, 1953. Table Rock is the first major project where the 7½ ft option has been exercised by the contractor.

In using 7½ ft lifts, the contractor is required to cool the concrete to 50F or below before placing it.

At Table Rock, chilled air is used to cool the dry aggregate. Sand and cement are not chilled. The water is chilled to 35 F and a portion of the water is replaced with flake ice to further reduce the temperature.

Mapmakers Are Told U.S. Still Only 37% Mapped

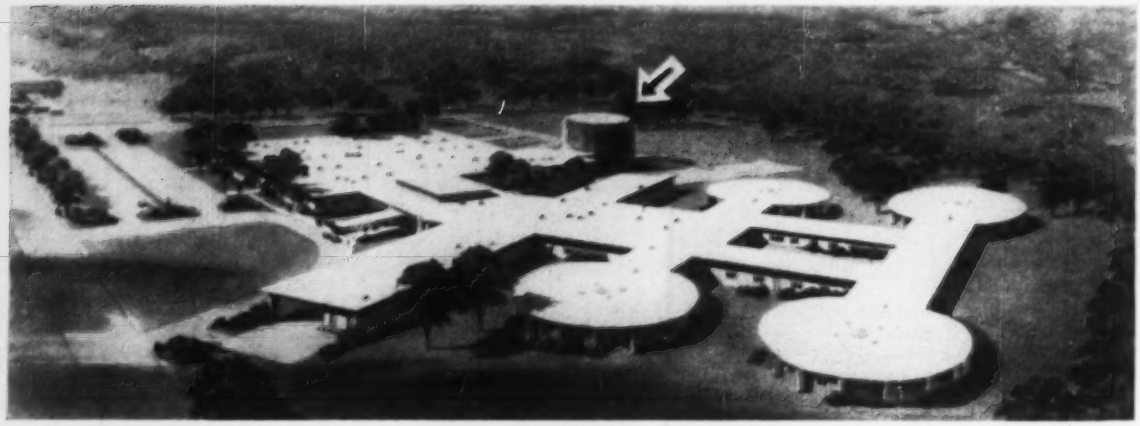
Mapmakers met in Washington last week where they heard that it will take another 17 years and $220 million to complete mapping of the U.S. And they also saw several of the machines and techniques—without which the job could take longer.

This was a joint meeting of the American Congress on Surveying and Mapping and the American Society of Photogrammetry.

Gerald Fitzgerald, chief topographic engineer of the U. S. Geological Survey, told those assembled that although the task began in 1777, today only 37% of the U.S. is covered by maps that meet modern standards.

Lester C. Higbee, president of W. L. Gurley & Sons, was re-elected president of ACSM.

William C. Cude, chief of the topographic department, Engineer Research and Development Laboratories, Fort Belvoir, succeeded Sidney Parks as president of ASP.



MEDICAL RESEARCH CENTER at Brookhaven National Laboratory will have a research hospital with a nuclear reactor (arrow).

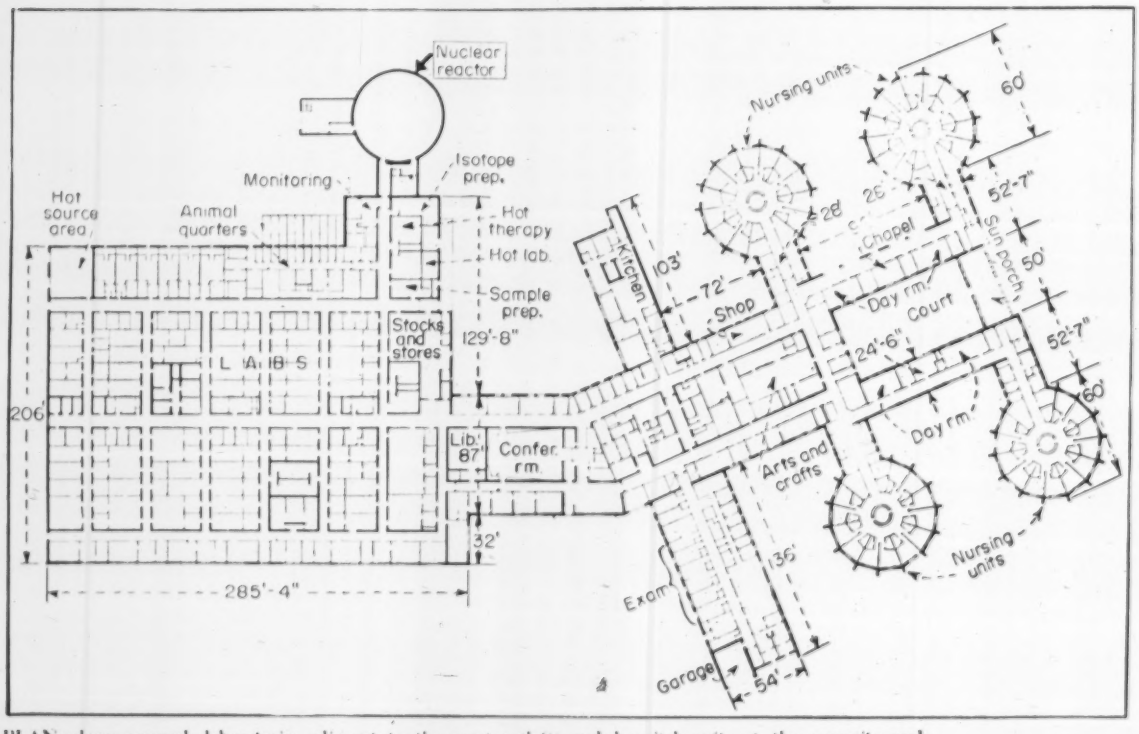
Nuclear Facility to Fight Disease

Bids will be received May 1 for a hospital specifically designed to use radiation in the treatment of disease. The facility, to be built at Brookhaven National Laboratory, Upton, Long Island, N. Y., will include a 48-bed patient unit, more than 37,000 sq ft of laboratories, and a nuclear reactor designed solely for medical research and treatment. (In addition, a similar reactor has been authorized for construction at the University of California.)

The reactor is designed to supply the BNL Medical Dept. with neutrons for treatment and radioactive isotopes for studying the biological effects of radiation and for investigating its clinical uses.

• **Designed in units**—The unusual plan for the medical center is based entirely on functional requirements. For each of the five basic sectors of the plan, a layout was adopted that would best serve that sector. Each was then assigned a position in the building in proper relationship to the other sectors.

Preliminary designs for each sector were developed over a period of years by the Brookhaven Architectural Planning Department in collaboration with the medical staff. In April, 1954, Eggers and Higgins were selected to make a thorough investigation of all factors involved in the design and construction of such a medical center, including the preliminary designs. Their report, issued two months later, upheld BNL findings. The architects then proceeded with final designs and the preparation of working drawings. Engineers Weiskopf and Pickworth (structural) and Syska and



PLAN places research laboratories adjacent to the reactor (left) and hospital units at the opposite end.

Hennessy, Inc. (mechanical) worked jointly with the architects on the technical phases of the investigation and drawings.

The five sectors of the Medical Research Center are interrelated. They include a research laboratory, with flexible divisions for biochemistry, physiology, microbiology and pathology, and animal quarters; a research hospital, with four 12-bed nursing units and facilities for occupational and physical therapy and rehabilitation; a medical reactor building, free-standing in order to assure safety from radiation hazards; industrial medicine; an out-patient department for all Brookhaven personnel; and facilities in the center of the plan to serve as a point of concentration for traffic from staff, visitors, out-patients and receiving and shipping of materials.

• **Hospital planned around reactor**—The medical reactor dictated the location of the other divisions. It is used by both the research laboratory and the research hospital, two of the major sectors. It has to be as near the patients in the research hospital as safety allows, yet adjacent to the various researchers; for the reactor's main task is to furnish materials for the laboratories.

A single-level plan was chosen over a multi-story building for several reasons. Since there is little of repetitive nature, the "stacking" of elements one above the other was not required. Too, the great volume of wheeled traffic, such as stretchers, beds, food trucks, and service carts moving heavy shielding and radioactive materials, is easily facilitated by the one-story plan.

• **Structural features**—Seven types of exterior walls were considered for the Medical Research Center (exclusive of the reactor). A cavity wall of 4-in. face brick with 2-in. air space and 6-in. concrete block was finally selected as most practical. Block partitions were chosen, as being thick enough to contain completely the roof-supporting lally columns, yet strong enough for carrying wall-hung cabinets and equipment.

Interior finishes were dictated by the need for the most inexpensive finish obtainable consistent with the function to be performed. Hung ceilings will be used primarily in the research laboratories because of the need to eliminate all dust-catching surfaces.

Because a 33x66 ft bay was desired in the laboratory to provide flexible use of space, lightweight roof construction supported on steel lally columns was studied. Poured gypsum roof on open web joists was selected for all but the nursing units, where, because of the circular shape, steel beams were selected, with poured gypsum on sub-purlins.

Heating systems (two-pipe, forced hot water for all but the research laboratories, where two-pipe low-pressure steam is used) are zoned according to exposure.

Industrial-type air-conditioning is provided in the laboratory sector for rooms where maintained temperature and relative humidity are necessary. Cooling of the reactor, necessary for its operation, is indirect and is accomplished by supplying conditioned air to the treatment rooms and thence down through the reactor. Domestic-type window units will provide air conditioning for the patients' bedrooms. Complete air conditioning was considered but was rejected for reasons of economy.

Year-round temperature and humidity control will be provided in the operating, fluoroscopy, x-ray and dark rooms in the research hospital. Mechanical supply and exhaust ventilation have been provided for occupied interior areas to the extent of a minimum of 12 air changes per hour. Radioactive, isotope, chemical and canopy hoods will be provided with a separate exhauster for each.

Huge Exhibit Hall Will Span Highway

Aiming for May 20 ground breaking, Detroit will take bids May 1 for construction of its $30-million exposition center.

Claiming top distinction for show space under one roof, the main building will provide 400,000 sq ft of exhibit area, outstripping New York's Coliseum (ENR Jan. 5, p. 34) by one-third. Plans for the project, which will round out the auto capital's new river-front civil center (ENR Feb. 3, 1955, p. 21), also include a connecting, 14,000-seat arena, 310 ft in diameter.

Straddling the six-lane John C. Lodge Expressway (arrow) with a pair of tandem 50-ft spans, the three-story 900 x 500 ft main building will incorporate—besides the record-setting exhibit floors—a ballroom, two restaurants, 32 meeting rooms, 90,000 sq ft of storage space, and other service facilities. Accommodations for 2,900 cars will include first-floor and roof parking for 1,700, surface lots and underground garage for the remainder.

Reinforced concrete beams in some areas, steel in others, will support the reinforced concrete floor slabs. Beams will be carried by 5-ft sq reinforced concrete columns.

Exhibit space will be confined to the first and second floors, designed for loads of 400 and 600 psf, respectively. Sloping terrain will permit ground-level access to both. Each of the exhibit floors can be used either undivided or as three separate halls, screened by movable soundproof partitions. The second floor, with 300,000 sq ft of the total exhibit area, can be subdivided into three equal halls, each with its own main entrance, truck access door and loading dock. The first floor's 100,000 sq ft of display space can be split into one 28,000 and two 36,000-sq-ft area. Ceiling clearances will be 19 ft 6 in. for the first floor, 30 ft for the second. Light intensity at floor level will be 60 ft-c. Both the main building and the arena will be air-conditioned.

Besides exhibit areas and small adjacent office rooms, first and second floor facilities will include storage space, a small restaurant, the ball room and five meeting rooms. The third floor will be occupied by a large restaurant, 26 meeting rooms, and other non-exhibit accommodations.

The new project is designed to harmonize esthetically with other civic center structures. The exterior of the exhibition building will be white marble facing with brick panel inserts. The arena will be paneled with green granite, trimmed with white marble.

The architectural firm of Giffels and Vallet, Detroit, was designer.

This Contractor Needs a Micrometer

Contract on a new missile testing facility at Holloman Air Force Base (that will, in part, require almost fantastic construction precision) has been awarded by the Corps of Engineers to Robert E. McKee, El Paso and Albuquerque contractor, on a low bid of $4,670,550.40.

The project—part of a huge expansion program—calls for construction of a 30,000-ft test track and re-laying of a present 5,000-ft track used for the last few years by Col. John P. Stapp, world's "fastest human" in his rocket-sled tests.

Second low bidder was Diversified Builders, Inc., of Monticello, Calif., with an offer of $4,941,937. Other bids ranged up to $5.8 million. The Corps of Engineers estimate was $4,810,000.

Locke Mouton, technical liaison officer for the Corps, said the project was one of the most exacting ever undertaken under the direction of his agency.

• **No deviation**—The tracks, almost 7 mi long, must be laid with a deviation of no more than .005 in. in any direction. Rail will be delivered in 39-ft lengths from the steel company. Each is to be laid, after being machine-welded to the preceding one, in the exact order they are received from the factory, to assure each butt joint is exactly the same composition. Each joint must be ground to a tolerance of .005-in. on top and sides. The rails will be welded into 10,000-ft lengths and the entire section slid along the concrete roadway, which forms the base, on roller bearings.

Alignment of the first half of the double rail will be done with 13 permanent monuments placed by the Corps through brass buttons placed every 100 ft in the center of the concrete strip.

The second rail can then be laid—with a tolerance between it and the master rail of .01-in.—with the use of gages. Mouton said the master rail must be aligned after dark so that refraction from sunlight does not throw calculations off.

The special rails are Bethlehem 171-lb Crane Rail No. 1 (standard railroad rail is rated at 134 lb).

Design of the track, on which missiles can be ground-tested, was done by the engineering section of the Corps under its chief, Harold E. Murray.

• **Other features**—Other parts of the McKee contract include laying the concrete strip; removal of 1,175,000 cu yd of earth; laying 35,000 ft of water line and 38,000 ft of underground cable; paving a road and construction of an access road along the track; building a diversion channel along the right-of-way to protect it from runoff, and construction of a dam across an arroyo.

Bid openings are scheduled on four other projects on the Holloman AFB expansion program within the next month:

• March 29—Construction of two missile assembly buildings, each part masonry and part aluminum siding on steel and each having two wings. On one building the wings will measure 60 x 150 and 42 x 150 ft; on the other they are 41 x 252 and 126 x 300 ft.

• March 30—Construction of six equipment and storage buildings ranging in size from 30 x 50 ft to 87 x 100 ft.

• April 10—Construction of further static missile test facilities, including 10 mi of railroad; 6 mi of paved road; 7 mi of natural gas line; 7 mi of large-diameter water line; a 1,000,000-gal underground fuel storage tank; a 300,000-gal elevated water tank, and two electrical substations.

• April 17—Construction of a static missile test laboratory of masonry construction with cement asbestos siding; building to measure 190 x 225 ft.

No Competition

Bid, 23% over estimate, takes Seaway lock job

It was more than 23% over the estimate, and it was the only bid received, but last week the St. Lawrence Seaway Development Corp. accepted a $26.8-million price for construction of Grasse River Lock near Massena, N. Y. A contract was awarded to the same five-firm joint venture already at work in the area for the Power Authority of the State of New York on both Long Sault Dam and the U.S. half of Barnhart Island Powerhouse.

Awarding agency was the Corps of Engineers, construction agent for the Seaway corporation on the extensive south-shore navigation work at the International Rapids section of the St. Lawrence. Contractors in the joint venture are B. Perini and Sons Co., Inc., Walsh Construction Co., Morrison-Knudsen Co., Utah Construction Co., and Peter Kewit and Sons' Co.

Corps of Engineers contracts as a rule are not awarded unless the bidder is within 15% of the estimate. But in this case it was the decision of the St. Lawrence Seaway Development Corp.—"after due consideration." Certainly consideration was given to the time that might have been lost in re-advertising the work in hopes of more, and lower bids. Schedules are critical on this Seaway work.

The $26.8-million contract is the largest awarded to date on the U.S. portion of the Seaway. It brought the total number of contracts to 10, with a combined current value of about $59 million.

Grasse River Lock will resemble Robinson Bay Lock; and the two will provide an 87-ft lift through the 10-mi Long Sault Canal, to carry traffic past the power project dams on the river. Both locks will measure 80 x 860 ft. Whereas Robinson Bay Lock will have had a vehicular tunnel built under and as an intregal part of it, Grasse River Lock work includes two swing bridges. The upstream bridge will carry rail and highway traffic; the highway crossing downstream is a spare.

Work on the Grasse River Lock is to be essentially completed by January 1, 1958.

Heavy Snowfalls Make Spring Floods a Virtual Certainty

Spring floods are a virtual certainty in the Pacific Northwest, as the result of a winter snowpack which is the heaviest in many years. Only below-normal temperatures and extremely light rains can prevent floods, said Anthony J. Polos of the U. S. Weather Bureau's River-Forecast Center at Portland, Ore.

In the Northeast, fingers are crossed. Ten to 20 in. of snow that fell during March 16-19 now covers most of the North Atlantic-New England states and a sudden rise in temperature will endanger the same unprotected areas hit by last August's hurricane-caused rains. Further there is concern for the Ohio Valley—because of existing high water, a residue from early March rains and melting snow.

But the biggest flood threat is on the Columbia River from The Dalles, Ore., to Kelso, Wash. A normal spring thaw will swell the river as high as 28 ft at Vancouver, Wash., where flood stage is 15 ft.

Other floods are likely in eastern Washington, on the Yakima, Okanogan, Wenatchee, Pend Oreille, Spokane, Methow and Snake Rivers. Some flooding already has occurred on the Yakima River at Ellensburg.

Snow continued to fall in the mountains until March 12, when the weather suddenly turned warm. Rain began to fall March 20 and further precipitation is likely.

Progress Report

Off-street parking plans tackled by seven states

A number of new developments affecting financing and construction of off-street parking facilities have been reported in seven states.

One major project—the long-proposed $11-million garage beneath Boston Common—may need an entirely new set of plans because revised ones reportedly contain objectionable features. Boston Common Garage, Inc., which was scheduled to start construction on March 15, changed its original plans to conform with a Superior Court ruling that the project must be built completely underground as called for by state enabling legislation.

Other parking developments:

Mississippi—The legislature has passed a bill authorizing cities of 15,000 or more population to establish municipal parking facilities. Until now, the figure had been 20,000.

Nebraska—An Omaha District Court has ruled as unconstitutional a 1955 state law that would have permitted issue of some $2.6 million in revenue bonds to finance construction of a 1,300-car garage under Douglas County Courthouse land. The court declared that the county land could not be used for such purposes because off-street parking in downtown Omaha is a question of local municipal concern.

New Jersey—Newark's City Council has appropriated $175,000 to the Newark Parking Authority to finance preliminary steps toward launching a program of downtown off-street parking development. The authority already has announced plans to apply for a federal loan to pay for a final economic and engineering study of a long-discussed underground garage beneath Military Park.

Pennsylvania—Philadelphia's City Council is considering a plan to appropriate $50,000 for an overall study of traffic conditions and parking facilities. If the money is voted, Wilbur Smith & Associates, New Haven, Conn., will undertake the project.

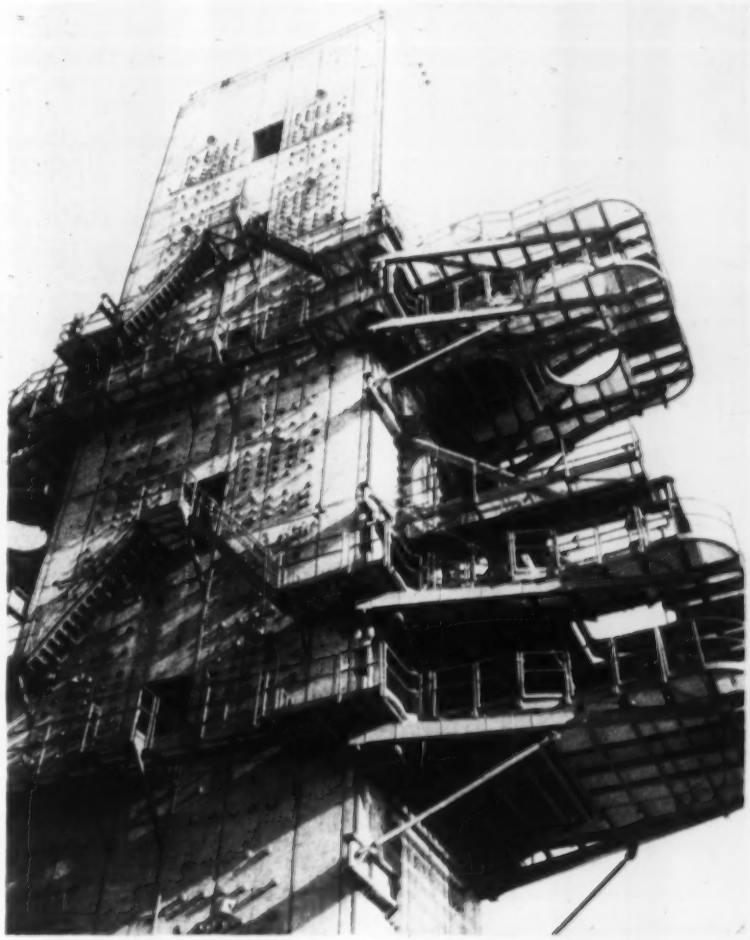
Rhode Island—The State Senate has passed a watered-down version of a measure proposing a survey of city and town parking problems by a governor-appointed commission. As originally introduced and passed by the House, the three-man commission would have had authority to consult with and advise local officials in development and planning of off-street parking facilities.

Virginia—A bill providing for creation of public parking authorities throughout the state has been introduced in the legislature. The proposal calls for establishment of five-man agencies to construct and operate parking lots and garages in much the same manner as turnpikes and toll bridges now are being built in the state. Each authority could issue revenue bonds to finance projects, borrow money from the federal government, lease facilities to private operators, and condemn land to acquire sites and structures. A second measure before the legislature would authorize a two-year study of the feasibility of constructing parking facilities beneath Capitol Square in Richmond.

Outdoor Plant Takes Blast With Little Damage to It

An explosion caused by a generator failure ripped through Pacific Gas & Electric Co.'s $80-million steam plant at Pittsburg, Calif., last week. Since the generating units are outdoors, little damage was done to the main plant.

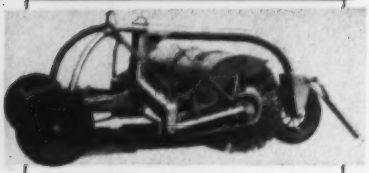
PG&E and representatives of General Electric, manufacturer of the damaged unit, are dismantling the $3-million turbogenerator to determine cause of the internal mechanical failure in the No. 1 rotor.



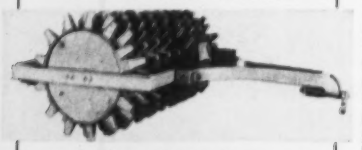
Tower Holds Rocket for Engine Test

The biggest test stand for stationary firing of rocket motors is now getting the finishing touches at the Army's Redstone Arsenal, Huntsville, Ala. Part of a $12-million test facility, the tower will anchor firing rocket engines while performance characteristics are studied. The 3-ft-thick reinforced concrete walls of the 20x30-ft tower rise 145 ft above ground. A 20-ft deep "basement" connects, by underground tunnel, to an observation and control blockhouse 2,000 ft away. A 45-ton-capacity gantry crane, mounted on a nearby steel tower, will lift test missiles into place. Movable platforms outside and an elevator inside the concrete test tower have been constructed to provide service access to test missiles.

Grace
ASPHALT
AND COMPACTION
EQUIPMENT

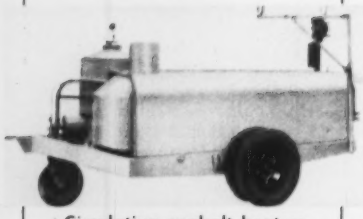


Roadsweepers, traction, engine-driven or tractor-mounted

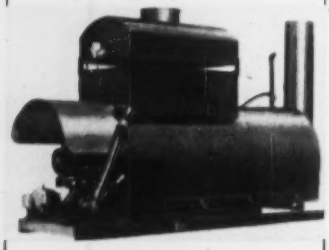


Sheepsfoot rollers

Chip spreaders



Circulating asphalt heaters



Automatic oil heaters for hot plants

Pneumatic rollers, self-propelled or trailed

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New Jersey Pigeonholes Engineer's Water Report

New Jersey's legislature has received and shelved a consulting engineer's report it requested on the old and serious problem of water supply for northern metropolitan areas.

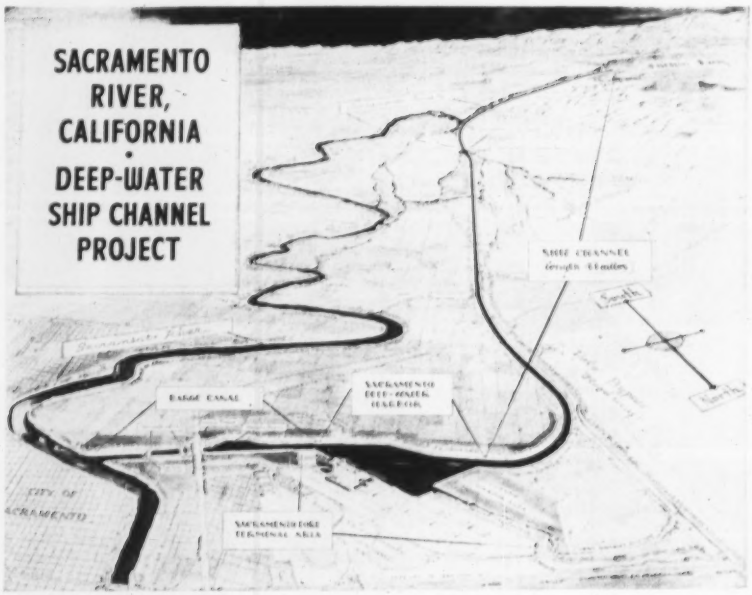
The report of Tippetts-Abbett-McCarthy-Stratton again warned the state legislators that water use in many areas exceeds safe yield. It rephrased the threat that water shortage can and would curtail the area's industrial growth unless something is done. It made clear that ample water is there to be developed and proposed a reservoir at Chimney Rock in Somerset County.

The Chimney Rock proposal was soundly defeated at the polls in November. Some of the legislators—who now choose to ignore the engineering report they ordered—admit being motivated largely by political influences. Others apparently are directing their attentions toward bi-state agreement that will result in damming the Delaware River at Wallpack Bend (ENR Mar. 1, p. 28).

Fort Worth Considers Plan To Erase Motor Traffic Jam

A venturesome plan to break traffic congestion that is strangling its central business district was presented to Fort Worth officials by Victor Gruen & Associates, architectural engineering and planning firm.

The proposed plan would eliminate all surface vehicular traffic, provide sub-surface freight facilities and ring the central area with a belt highway tied in with the road network serving the city and suburban regions.



Sacramento Channel Will Get New Start

Completion of the $35-million deep-water channel project at Sacramento, Calif., now seems assured after a four-year delay.

The Sacramento District, Corps of Engineers, scheduled to open bids March 20 for resumption of work on the 43-mi channel. The project—halted by the Korean War—will provide a deep-water shipping route from Sacramento to San Francisco. It will be 15 mi. shorter than the existing shallow, winding course of the Sacramento River.

The initial $1.8-million phase will consist of dredging in the Prospect Slough–Liberty Islands arc north of Rio Vista. The dredging contract will be awarded on a continuing basis with funds to complete the work coming from Congressional appropriations.

The next phase will be construction of a barge canal lock and single leaf bascule-type bridge to permit shallow draft vessels to bring cargo to terminal facilities. This $6.2-million installation—to be located just south of West Sacramento between the Sacramento River and the port terminal turning basin—is scheduled for a construction start in 1956-1957.

It is estimated that the project will be completed in four years if Congress provides adequate appropriations. Congress already has voted $500,000 for the work. And President Eisenhower's current budget calls for an additional $2 million.

New RB&W Booklet gives the plain facts on bolting

...a big help for steel constructors

THIS NEW instructive booklet was prepared with ironworkers in mind. Quickly and to the point, it gives all the information a man needs in order to use high strength bolts to make a better steel joint . . . whether he's erecting a building or bridge, or repairing equipment.

It's timely information, too. More and more buildings are now being bolted instead of riveted. RB&W is proud to have pioneered in this development. Send for free copies of this booklet – and tell us how many you want for your men.

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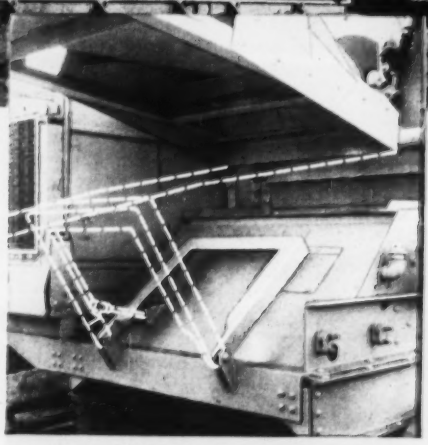

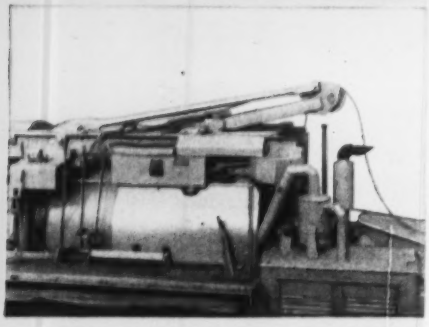

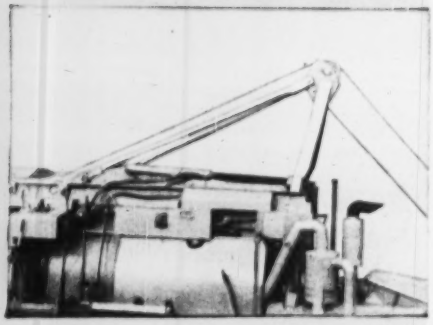

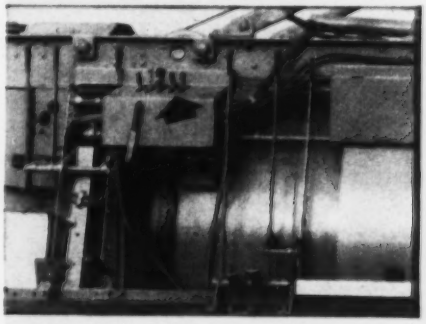

A-Frame Down

With the A-Frame in the down position, as shown at upper left, the MultiFoote Paver overall height is instantly reduced to clear bridge or overpass. This low clearance not only facilitates traveling under low overhead structures but also aids in transporting.

A-Frame Up

By touching a hydraulic control lever the A-Frame is quickly raised and the MultiFoote is ready for operation, as shown in lower left. With this arrangement the MultiFoote Paver has retained all the advantages of single cable operation.

Skip Carrier

When traveling with the A-Frame folded down, the skip rests on a hydraulically controlled skip carrier, as shown by the dotted lines in the photo at upper right. When the paver is working, the bracket folds down against the frame, out of the way.

Operator's Platform and Controls

Five small finger operated levers in the picture at lower right control hydraulic cylinders which actuate A-Frame, skip carrier bracket, transfer, discharge and bucket spotting. All controls are centrally located for ease and speed of operation.

NEW LOW CLEARANCE HEIGHT and COMPLETE HYDRAULIC CONTROLS make the MULTIFOOTE even better

New Design Cuts Cycle Time by giving you Faster Skip Operation PLUS—faster travel preparation • faster bucket spotting • faster discharge

MultiFoote Pavers with these new hydraulic controls and faster skip operation give you an even faster cycle time than before, *plus a new low overall clearance height.* You get all the advantages of single-cable skip control with its high speed, simple reeving and low maintenance cost. Now in a matter of a few seconds, the operator can raise the skip carrier bracket and lower the A-frame with fast-acting hydraulic cylinders to get under overpasses, bridges or other low overhead clearances.

Hydraulic controls also step up the high capacity of the MultiFoote by faster batch transfer, faster discharge chute operation and faster bucket spotting. These hydraulic controls plus the faster skip operation now mean that you can put out more concrete with a Blaw-Knox Paver than any other paver.

All the features that have made MultiFoote Pavers the leaders in their field have been retained or improved. The efficient double-cone drum folds material over and over for thorough mixing, has no corners for material to build up in and cleans itself with a scouring action. High operator's platform gives the operator an unobstructed view of skip and bucket at all times—there are no "dead spots." Efficiently grouped controls for manual and automatic cycle operation cut seconds out of the mixing time for each batch. Shovel-type crawlers with their self-cleaning action give positive traction, ample flotation on soft grades and are designed to stand up to miles of highway paving travel. Volume measurement, non-pressure water system that is unaffected by grade, the wide, smooth rigidly mounted skip and simplicity of design assure shift-after-shift high capacity and easy upkeep.

If you are bidding on turnpike work or any big paving job, see your Blaw-Knox Distributor and get all the details on the New MultiFoote with hydraulic controls.

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BLAW-KNOX COMPANY

Construction Equipment Division, Mattoon, Illinois

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Big machine volume and speed in this compact new

PRINTMASTER 810

Sturdy, compact, smartly styled, the new medium-priced Printmaster 810 has *everything*—easy, low-cost operation, high speed and *big machine* production capacity.

It prints and develops in one continuous operation at speeds up to 40 feet per minute . . . easily handles roll or cut stock as wide as 42 inches. Easy-to-reach controls command quick response throughout the machine's entire operation. Developing and printing sections are automatically synchronized for simplest operation at any speed.

Complete diffusion of vapors through exclusive "jet-nozzle feed" insures uniform, dry, fully developed prints. Spacious receiving trays automatically stack prints in sequence. Electrically welded one-piece assembly stands 61" high, 61" wide, 42" deep (including feedboard).

See and try the Printmaster 810 yourself. Call your nearest Ozalid distributor for a demonstration. His number's in the phone book, or write Ozalid, Dept. N-5, Johnson City, N. Y., for descriptive brochure.

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Got A Printmaking Problem? Call your local Ozalid representative. It is expert advice is yours for the asking—whether or not you now own or plan to buy Ozalid equipment.

Tunnels Authorized

Assembly okays structures before close of session

Before the close of its recent session, the Virginia General Assembly paved the way for two tunnel projects, one of which may cost as much as $200 million.

The Assembly authorized the Chesapeake Bay Ferry Commission to construct a major connection between the Eastern Shore of Virginia and the "mainland" and provided legislation for a second tunnel between Norfolk and Portsmouth.

Because of the great size and cost of the Chesapeake Bay facility (ENR Feb. 16, p. 44), the commission has been authorized to buy and operate the present ferry system between Little Creek (near Norfolk) and Kiptopeke. The commission will issue $20 million in bonds for this and has been authorized to spend $500,000 of that amount for planning on the project.

The present ferry route is 21 mi long, but it would be possible to construct a bridge-tunnel from near Cape Henry to Cape Charles that would be only about 12 mi long.

The second Norfolk-Portsmouth tube is nearer reality. It has been declared feasible by engineers De Leuw, Cather & Co., of Chicago; and Thomas A. Thompson, vice president of the tunnel commission, says that work can be started within eight months and completed in three years. Preliminary engineering reports are being obtained, and chances are good for a work start this year. It is to be built by the Elizabeth River Tunnel Commission, which built the Norfolk-Portsmouth bridge-tunnel, opened in May 1952.

This new tunnel will be financed in connection with the present facility—part of whose bonds already have been paid off.

Plan Third Arterial Route To Ease Honolulu Traffic

Honolulu is considering a mile-long, six-lane skyway to help move traffic from its downtown section toward Waikiki. Preliminary plans have been outlined by the Territorial Department of Public Works, although no designs or cost estimates have been prepared.

The skyway would be the third arterial to be constructed since World War II for carrying through traffic across the city. The second is still under construction.

Roughly the routes parallel the coastline and the third route would lie between the first two.

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Adjustable Screed Chair assembled with 1" pipe screed in STANDARD HOLDER
Adjustable Screed Chair assembled with rectangular metal screed in STANDARD HOLDER
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Durably constructed and designed to provide maximum support and adjustability, Superior Screed Chairs permit easy and quick positioning and adjustment of pipe or bar screeds regardless of deck or slab variations. There is no interference from reinforcing steel in placing these chairs and they are readily nailed to the deck if desired.

A variety of assemblies are available to meet virtually any job requirement — for formed slabs or for slabs on fill. Write for details.

For maximum efficiency, select SUPERIOR for *all* your concrete accessory requirements and be assured of the *best* in design, material, and workmanship, plus the assurance of dependable delivery. Request a copy of our new catalog 500 — it contains a valuable table for spacing studs, wales and form ties.

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Even the gentlest of surf action transports sand, eats away at our beaches . . .

. . . and hurricane waves devour the beach and break through to destroy shore property.

Taking the Unknowns out of Shore

This month, key people from coastal divisions of the Corps of Engineers are in Washington to learn what is now known about hurricane waves—and the result of this knowledge will be added sand on our beaches. Their school, naturally, is the laboratory-headquarters of the Beach Erosion Board. Organized since 1930 under the Chief of Engineers, the Beach Erosion Board has come to be the world's foremost consulting service on problems of shore protection.

As they started their three-week course this month, these students of hurricane waves and their effects well may have been indoctrinated with this little bit of truth by Brig. Gen. Theron D. Weaver, board president:

"Sand on our beaches is a natural resource, just as water in our rivers. As such, it must be controlled, conserved."

That is the way the Beach Erosion Board sees its mission. The board's four members who are Corps of Engineer officers, and its three prominent civilian engineer members direct all their efforts and those of a 28-man technical staff and 28 non-technical personnel to the collection and dissemination of information on beach erosion, its prevention and control.

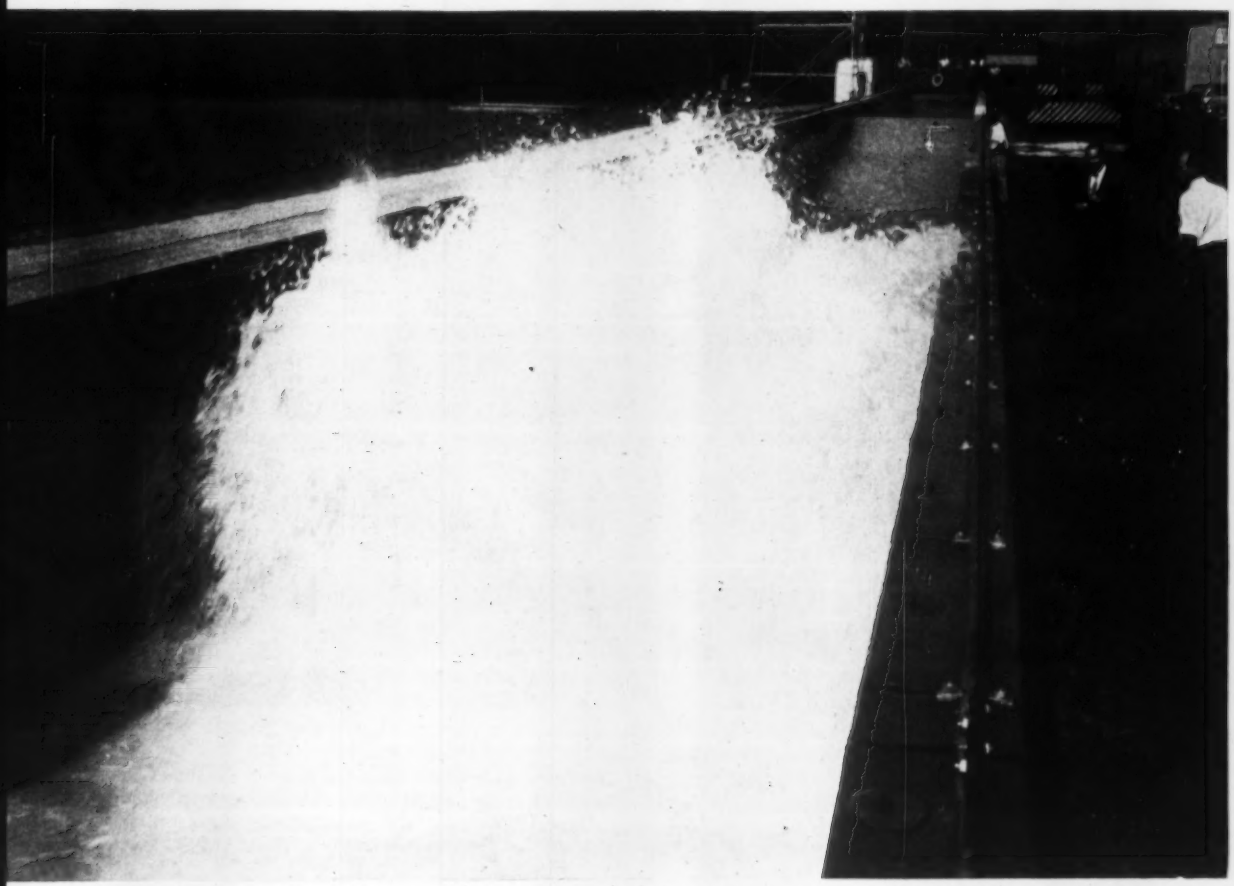
• **Started from scratch**—When the BEB began its work 26 years ago, little prior research had been done here in the U. S., some had been done abroad. A wave tank was set up at Ft. Belvoir, and a three-year study of beach erosion on the New Jersey coast was undertaken.

In 1938 the board moved to its present Potomac River headquarters, near the west edge of the District of Columbia, alongside Dalecarlia water treatment plant. Twenty years of progress there culminated in 1954 with the publication of "Shore Protection Planning and Design," bible on beach erosion control.

In the meantime there was a war, and while the exact nature of its wartime efforts are not discussed, the board has a very important function as the nation's expert on worldwide beach intelligence for amphibious warfare operations. An additional 43 people now work at this assignment.

• **Most progress is recent**—It is mostly since World War II that the BEB has blossomed into a repository of information on coastal engineering. The Dalecarlia labs now boast five wave tanks. From these and from the farmed-out research projects done for BEB at several universities and at the Corps' Waterways Experiment Station at Vicksburg there now come results of a dozen studies per year—studies that generally take one to two years to complete.

The hurricane study program now under way is an example of BEB's consulting function. The entire program, for which Congress appropriated $1 million last year (ENR Aug. 25, 1955, p. 21), is being carried out by the Corps of Engineers with the Weather Bureau as a participating



With its new full-scale wave tank, the Beach Erosion Board can check wave action.

Protection

agency. It is a three-year study that may cost $3 million. The Beach Erosion Board's function will be solely in a consulting capacity. It will use such devices as the current course of instruction to disseminate what it knows of hurricane waves and their control.

• Helping others help themselves—More typical of the consulting that BEB generally does are its studies of specific coastal engineering problems, its research into life of protecting structures, and its investigations into the mechanics of shore processes.

BEB's purpose is "to help others help themselves." And here's the way it works:

A state or local agency comes to the board with a beach erosion problem. The board reviews the problem and may approve a study of it. The federal government, by executive ruling under a 1930 law, finances 50% of cost of any study BEB undertakes; the locality for which the work is done pays the other half.

There are certain stipulations: Principally, the locality has to appoint an engineer to act as liaison between the local authorities and the District Engineer charged with directing the study. A report, prepared by the District Engineer and reviewed by BEB, on a given problem defines very well its solution, but the preparation of contract drawings and supervision of construction is left to the engineer appointed or engaged by the locality.

After the actual shore protection work has been completed, and provided Congress has adopted it as a federal project on BEB's recommendation, the federal government reimburses the locality for as much as one-third the cost of construction. This federal financial aid was authorized in a 1946 law, and it is limited to costs of protecting public properties.

• The fund of knowledge—Aside from its investigations into specific instances of erosion, the board does much basic and applied research on the overall problem. In 15 years up to 1945, BEB published 10 technical reports and memoranda. Since passage of a 1945 law establishing authority for expanded research, the board has published close to 100 additional reports, including its Technical Report No. 4, the single, loose-leaf volume intended to include all design information accepted to date. This document is to be supplemented periodically as more knowledge is gained through research.

The board considers its work to be a science still very much in the development stage. The formulas, definitions and typical designs presented in Technical Report No. 4 are interspersed with phrases like: "frequently unreliable . . . not clearly understood . . . no satisfactory instrument . . . exact nature not determined."

Beach erosion is a young science that began only in 1916, with pioneering work done at Columbia University by Douglas Johnson. Shore processes, the behavior of beaches, are not yet exactly defined. The full mechanics are still secret. But the body of knowledge is growing, and the Beach Erosion Board is now better than ever equipped with the knowledge and the tools to do its work.

(Continued on page 36)

Before

After

Beach Erosion Board's classic example of how feeder beach can nourish miles of shoreline is at Santa Barbara, Calif. In 1936, beach east of Santa Barbara harbor had been swept away by littoral currents; erosion extended 10 miles from this point. By 1938, placement of a feeder beach had restored the shore. Replenishment of its sand supply at two or three-year intervals had stabilized the 10-mile beach and protected without use of structures the valuable shore properties along this stretch of coast.

• **World's largest wave machine**—Just last year, the board dedicated a $700,000 tank with a wave machine that produces a 6 to 7-ft wave (see photo). This 635-ft tank is a veritable beach on which breakers crash with awesome authenticity. This is the tank BEB has been waiting for.

Now it will be possible to make full-scale tests on structures in the surf zone under controlled, laboratory conditions. Now it will be possible to check full-scale the information that has been collected from the older 85-ft wave tank and the 150-ft semicircular shore process test basin. Built outdoors in 1953, this basin gives qualitative information only.

Waves are generally recognized as the dominant factor in shoreline changes and structural damage. Waves plus the other littoral forces (tide, currents and wind) determine the behavior of a beach. Will it exhibit erosion, stability or accretion? If erosion, how best is it to be controlled?

These are the questions the board must answer, and some of its answers have been most interesting. Beach fills, pumped for restoration or nourishment, have been an interesting development, and the work done for Santa Barbara, Calif., has become classic (see photos). All sorts of groins have been investigated, appraised and designed; life of materials of groin construction is continually being studied. There is a strong trend away from defensive works; it is thought better and cheaper to add sand supply.

• **Renewed interest now**—This year there is special interest in activities of the Beach Erosion Board. Primarily, the enhanced interest is due to 1954 and 1955 hurricanes along the East Coast and the interagency hurricane study in which BEB is consultant.

Additionally, there is a bill before Congress this year (sponsored by New Jersey's Congressman James C. Auchincloss) that would change the present law which restricts federal aid (4 the project cost) to protection of public properties. A study of New Jersey's beaches from Sandy Hook to Barnegat Inlet in 1954, indicated that the federal share of a $25-million shore protection project would be $3 million—much of the shore is private property.

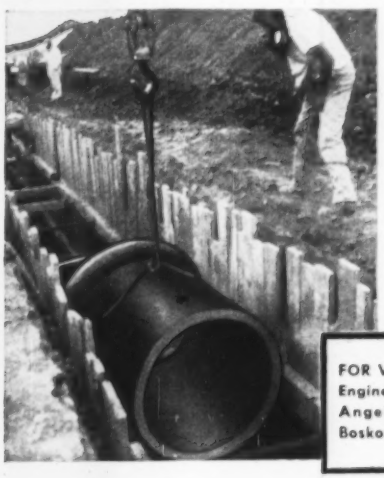
Another question that has come up is whether federal aid should be restricted to first cost of projects. Where structures are built this makes sense, but where the project is one of beach restoration through periodic pumping of sand, it is thought by some that the government should share this cost.

Further thinking on changes in the law affecting who does coastal engineering is not too clearly defined. It would be conjecture to say that out of the current hurricane study might come legislation to put the Corps of Engineers into hurricane protection as fully as it is now concerned with flood control. But it is quite safe to say that the field is in a state of evolution. The hurricane studies should determine what can be done. Next step would be to determine who will do it.

Present membership of the Beach Erosion Board, in addition to its president, Brig. Gen. Theron D. Weaver, includes: Brig Gen. H. J. Hoeffer, South Atlantic Division Engineer; Col. Clarence Renshaw, North Atlantic Division Engineer; Col. William F. Cassidy, South Pacific Division Engineer; Dean M. P. O'Brien of the University of California; Dean Thorndike Saville of New York University; and Lorenz G. Straub, director of St. Anthony Falls Hydraulic Laboratory. Richard O. Eaton is the board's chief technical advisor, its ranking civilian employee. Capt. Charles I. McGinnis is its executive officer. J. M. Caldwell heads research; J. V. Well, engineering; W. C. Iseminger, military intelligence; A. C. Rayner, project development.

CLAY PIPE RESISTS CORROSIVE GAS IN ANY CONCENTRATION

THIS VAN NUYS, CALIFORNIA, Clay Pipe installation replaces the original line where the destructive effects of sewer gas proved that only Clay Pipe could handle the job successfully. Nearly 12,000 feet of 30-33-36-39-inch Clay Pipe was installed to replace the previous non-clay line. The job was more costly because sewage from the old line leaked into the new trench.



FOR VAN NUYS, CALIF.—City Engineer, Lloyd Aldrich of Los Angeles. CONTRACTORS—Bosko and Bradarich.

Replacement jobs like this prove that you *always* save money by installing Clay Pipe first. It can't be eaten away by any of the acids and chemicals found in residential or industrial wastes. Its cost per year of service is the lowest. And the new jointing techniques developed through Clay Pipe research result in tight, infiltration-proof lines that cut costs at the treatment plant. Why take chances on substitutes? Use Vitrified Clay Pipe . . . and be sure the job is down to stay.

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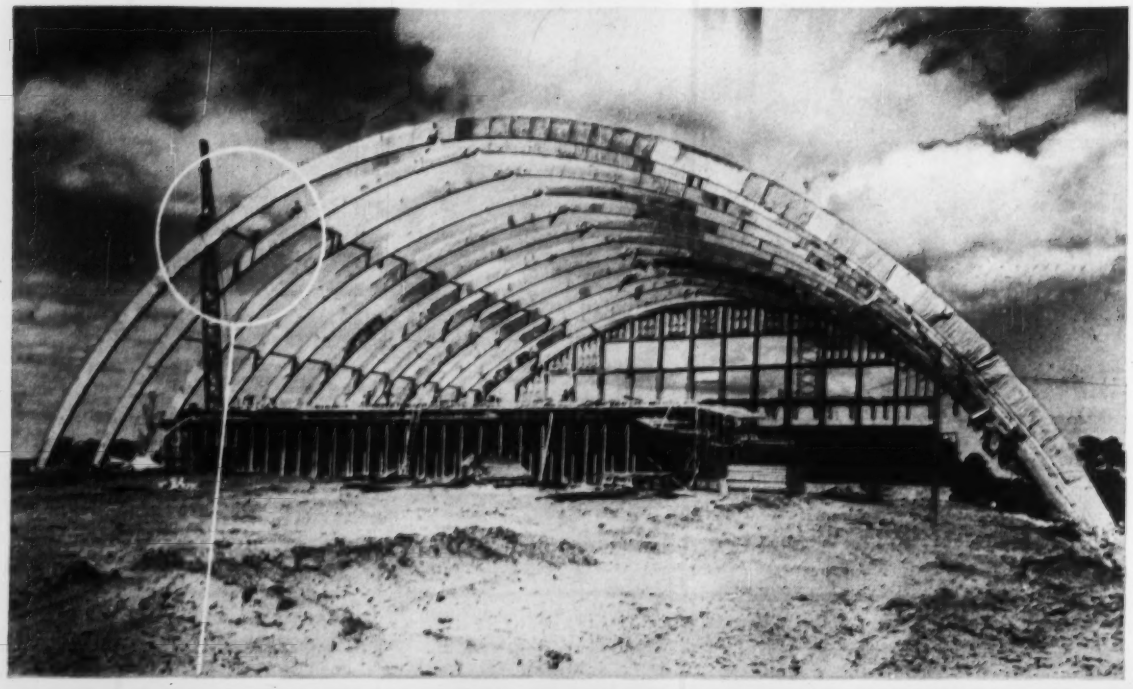
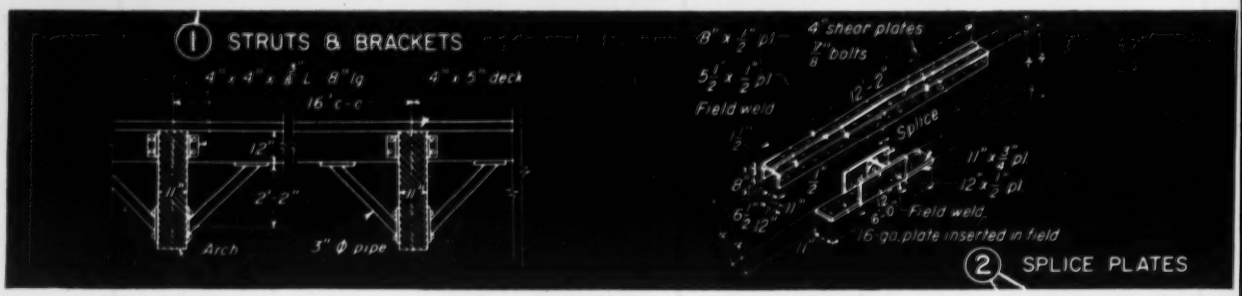




Glued-laminated sections, 46-in.-deep, call for careful attention to hinge and splice details

Record Wood Arches Span 242-Ft Arena

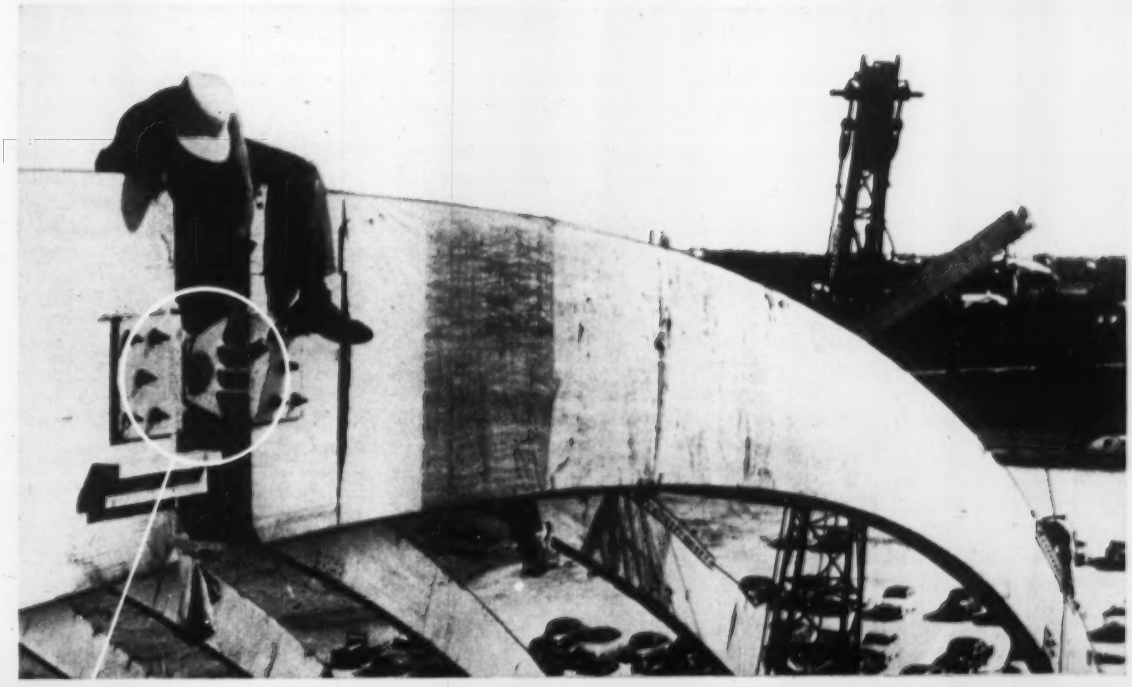
W. H. O'Brien and T. E. Brassell
Chief, Technical Division Engineer
Southern Pine Association, New Orleans, La.

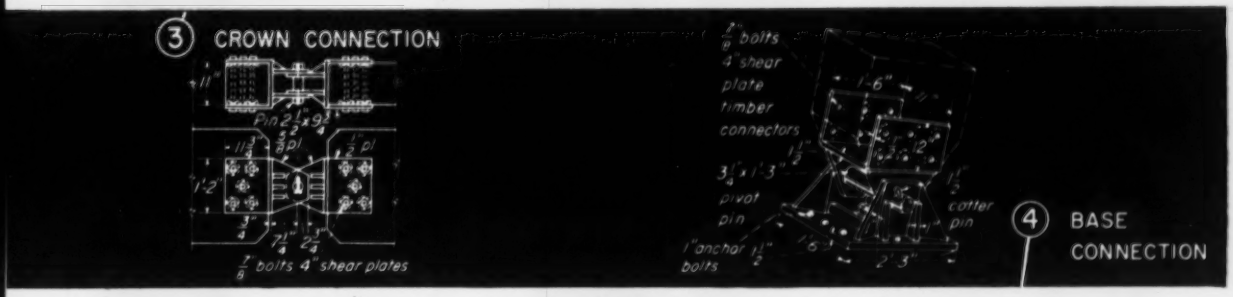
A new world's record for long-span, glued-laminated timber arches was set on completion of the 3,500-seat Jai Alai Fronton at West Palm Beach, Fla. It has 12 arches, each having a clear span of 242½ ft, a rise of 74 ft, and a circumferential length of 294 ft.

These 3-hinged arches vary in depth from 25 in. at the base to 46 in. near the splice, or quarter point, and 20 in. at the crown. They are spaced 16 ft apart. Each arch weighs over 15 tons and contains about 17,000 fbm. The contract also included 280,000 fbm of double tongue-and-groove 4 x 5-in. wood-deck roof sheathing.

Jai alai will be played on a court 176 ft long and 55 ft wide, with three walls 40 ft high.

• **Why wood?**—Wood was chosen for the arches and roof deck of this structure because of economy and ease of erection, because it produced a simple and attractive building and because the sheathing, applied in random lengths, provided continuity of the roof skin. Providing interior finish, good insulation and form-free installation, this type of deck also eliminated the need for purlins, joists and other bracing. Only four rows of struts, each 7 x 12





in. by 15 ft long were used between the arches.

Fast delivery and speed of erection were important. Only ten weeks elapsed from date of order to date of shipment. This type of structure can be erected quickly, and since the building shell was entirely separate from the seating and other interior construction, work could proceed simultaneously on all parts of the structure.

• **Heat, sound and fire barrier**—The insulating and sound-absorbing qualities of the wood will keep noise at a lower level than is possible with many other exposed structural materials. The large-section, glued-laminated arches and wood deck also provide a relatively high degree of fire resistance, which has long been recognized in heavy timber construction.

With the flexibility of a curved arch design, proper clearances are obtained

. . . Wood arches span sports arena

where needed, especially at the center of the building, and give the spectator the feeling of freedom afforded by outdoor courts. This feeling is further enhanced by a ceiling painted midnight blue and a lighting arrangement installed so that the ceiling will give the impression of open sky.

Despite the simplicity of the structure, its unprecedented size created problems. Quality requirements make it impossible to glue-laminate arches in the field, so they have to be fabricated in specially equipped plants. Handling and shipping imposed about the only limitations on the size of these members. Ordinarily, three-hinged arches are shipped in two half-spans with the field connection as the third hinge. The immense size of these arches dictated that each span be shipped in four sections to meet railroad clearance requirements.

The shape of the arch axis was made a segment of a circle. (The radius of the arch varies slightly because of the variation in depth of section.) One arch is exposed and, for appearance, its 46-in. depth is maintained to the crown. Width of all arches is 11 in.

The base and crown connections were made through welded steel hinges with machined pins. Timber connector shear plates were used in all steel-to-wood connections. The arches were designed in accordance with American Institute of Timber Construction Standards.

• Design data—The loads used complied with the provisions of the Southern Building Code.

Separate calculations were made for positive pressures of wind loads on the windward side of the roof with simultaneous negative pressures on the leeward side.

Additional calculations were made to determine adequacy of the fastening of the deck to arches—two 7 x 0.207-in. dia threaded spikes were toe-nailed into the arches through each piece of deck; also, one ½ x 6-in. lag bolt with washer was used every 4 ft. These fasteners were found to be more than adequate to resist any uplift caused by wind.

Despite the heavy wind loads used in design, the critical load condition on the arches was dead load plus live load over full span. In sections near the crown, dead load plus live load over half the span governed.

The arches rest on reinforced concrete buttresses. The horizontal component of the reactions is absorbed by three 1¼-in. dia steel rods in the floor extending between buttresses. These rods were pretensioned by a turnbuckle. The vertical components of the reactions are transmitted directly to the soil.

• Splices posed a problem—The arch splice joint was one of the most unusual problems encountered in the design. Primary considerations in the design of this joint were:

The splice must rigidly resist the moment, shear and compression developed at that section.

The length of splice should be as short as possible to transfer stress as near the joint as possible so that the assumptions made for calculation of moment would remain valid.

Slippage, or inelastic deformation, should be held to a minimum.

The splice should be quickly applied in the field with perfect alignment of the arches.

The connection should not materially reduce the cross section of the arch.

The splice should not present an unsightly appearance.

A novel feature of the joint was field welding of the splice plates. Individual plates were first attached and seated in place, then slightly prestressed. While aligned, they were then welded together to form a channel with top and side plates joined to operate as a unit as load is applied to the arch. The splice was designed to resist a moment of 3,873,000 in.-lb. A 16-ga steel plate was inserted on the compression side of the splice to take full allowable bearing parallel to grain.

Since each half arch is basically a column with an eccentric load, consideration must be given to lateral stability—in particular, the slenderness ratio, l/d. The solid rectangular section of the laminated arch gives lateral stiffness by virtue of its shape. The deck attached to the top edge adds stability, and laminated struts with pipe knee braces provide interval bracing of the lower edge.

The arches were fabricated by Unit Structures, Inc. They were assembled of nominal 2 x 12-in. southern pine. A combination of stress grades B and B Dense and No. 2 southern pine, called 17, as shown in the "Standard Specifications for the Design and Fabrication of Structural Glued Laminated Southern Pine," permits allowable stresses as follows: fiber stress in bending, 2,800 psi; compression parallel to grain, 2,000 psi; shear, 200 psi; compression perpendicular to grain, 450 psi; and modulus of elasticity, 1,800,000 psi.

Grade-marked lumber was used for the entire project, and inspected by the Southern Pine Inspection Bureau.

• An airfield used for layout—Plywood templets were constructed to the exact shape and size of the arches. These templets were used in setting gluing forms and later in trimming the members. Because of the large size of the templets and their radii, the runway of a nearby airport was used as the layout "floor" for pattern construction.

The first step in the manufacture was the scarfing or end beveling of 2 x 12's so that they could be end glued to form full length lamina. The longest lamina was over 90 ft.

The lamina were then surfaced two sides to provide clean and smooth contact surfaces for proper glue bonding. Glue was spread on both sides of each lamina by a double roll mechanical glue spreader, with the lamina assembled in the form. The section was pulled into shape by screw clamps applying a uniform pressure of 150 psi on all glue lines. The arch sections were allowed to cure in these forms until the glue had set and developed bond strength. Interior arches were fabricated with a casein water-resistant glue, and the exterior arch with a waterproof phenol-resorcinal type resin glue.

After curing, clamps were removed and the sides of the arches surfaced by a traveling planer on an overhead crane. The plywood templets were then used for trimming, and the shear-plate grooves and bolt holes drilled for splice connections. A clear sealer was applied, and sections wrapped in a waterproof paper for shipment.

• A long trip for arches—The arches were easily loaded by a truck crane, the heaviest section weighing about four tons. Idler cars were loaded with the shorter sections, including the struts. This reduced shipping costs. All cars were shipped together in a train load for the 1,000 mile trip from plant to site. No damage occurred in transit.

At the site, splices and end connections were applied to the sections, and each half arch was attached to the base connection on edge. Two mobile cranes lifted the two halves, rotating them about their respective base hinges until the crown hinge was in correct alignment. Insertion of the crown hinge pin completed the arch erection. As each successive arch was erected, it was tied to the adjacent arch with four struts.

B. T. Richterkessing, of Richterkessing Steel Erectors, Inc., supervised the erection. The architects for the Jai Alai Fronton are Spicer and Gehlert, of Daytona Beach, Florida. The structural engineer was J. G. Moore, of Daytona Beach. Associated with Unit Structures, Inc., in the final design was L. W. Crandall, consulting engineer, Madison, Wis.

"Most versatile units we've ever used!"

says Roland L. Bowen, A. Bentley & Sons, Toledo, Ohio

Four Gar Wood "75" excavators, two on crawlers and two on truck chassis, handle a wide range of applications more profitably for this leading contractor. Roland Bowen, master mechanic for the firm, says, "We've worked our 75's on bridges, tunnels, caissons, powerhouse and factories—and we've found them the most versatile, most satisfactory units we've ever used. Equipped with the foundation borer attachment, our 75's are used to drill for caissons . . . with the dragline to excavate for drainage. And, they're easily converted for steel erection."

Servicing is simple, too. "No special tools or presses are required," reports Bowen. "Since all shafts are splined, we can handle occasional repairs quickly in our own shop. Our repair bills have been practically nothing!"

Gar Wood "75's" deliver this kind of low-cost, dependable workability because they're built by specialists in ¾ yard machines. Find out for yourself how this specialization can pay off in more profit on your next job. Call your Gar Wood dealer or write: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

Gar Wood's exclusive Foundation Borer attachment has cut footing costs on many Bentley jobs. Machine bores a clean round hole, then bells hole at the bottom. Digs up to 26 unreinforced footings per day. Fast, positive hydraulic control. Completely convertible.

GAR WOOD INDUSTRIES, INC.

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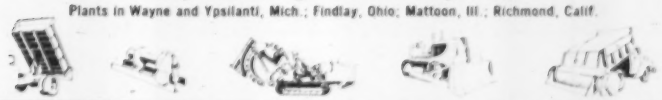
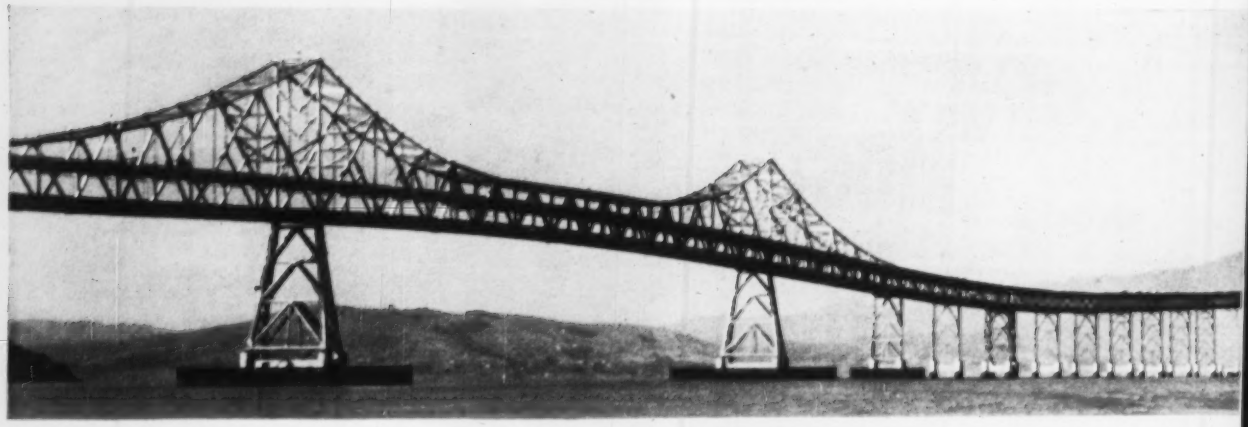
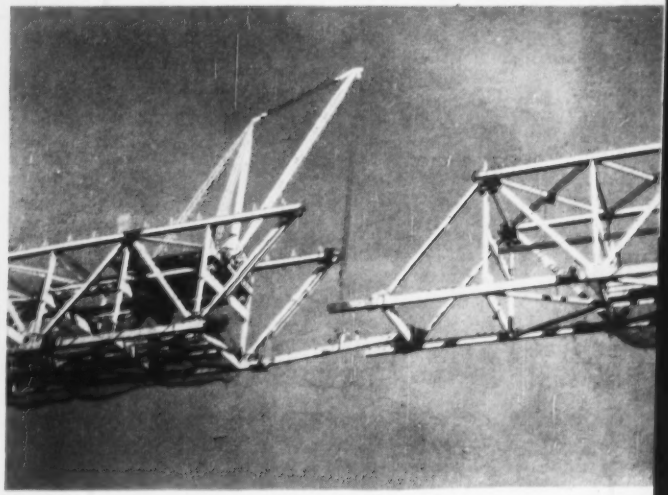
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.



Gar Wood—St. Paul Hoists & Bodies | Gar Wood Winches | Gar Wood-Buckeye Ditchers | Gar Wood Tractor Equipment | Gar Wood-Buckeye Spreaders





Closing link swings into position on the west cantilever span of the Richmond-San Rafael Bridge. And for the first time, the north arm of San Francisco Bay is bridged as . . .

Four Miles of Steel Near Completion

A 35-ton steel member slipped into place March 7 and the north arm of San Francisco Bay was bridged for the first time. With this closing of the west cantilever span—days ahead of the schedule set up by the contractor, Judson Pacific Murphy-Kiewit—the Richmond-San Rafael Bridge reached what is considered by most bridge erectors to be the climax in its construction.

The remaining steelwork, painting, deck paving and electrical work should be completed in ample time to permit the bridge to open in October.

Just a little over two months ago it seemed doubtful that the closure would be made on schedule—set for St. Patrick's Day by project sponsor J. Philip Murphy and project manager Francis J. Murphy.

Using the balanced method of construction, JPMK had completed one back span and one side of the cantilever span of the west channel. Then construction forces were shifted to the other back span and the other side of the cantilever. This left the cantilever span projecting 500 ft out from its supporting tower when heavy December storms hit—the same storms that flooded big areas in northern California. The steel already erected rode out the storms without damage, but the schedule was completely upset.

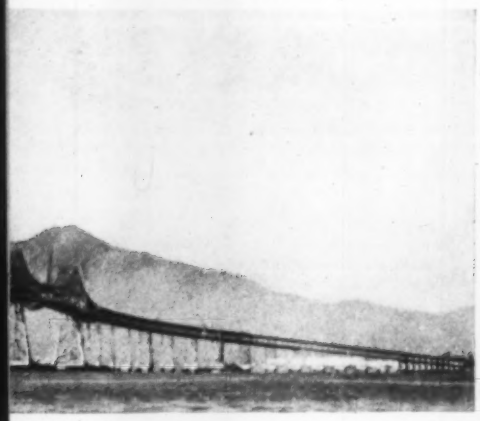
Then the weather cleared and things fell into place. Result was closure several days before St. Patrick's Day.

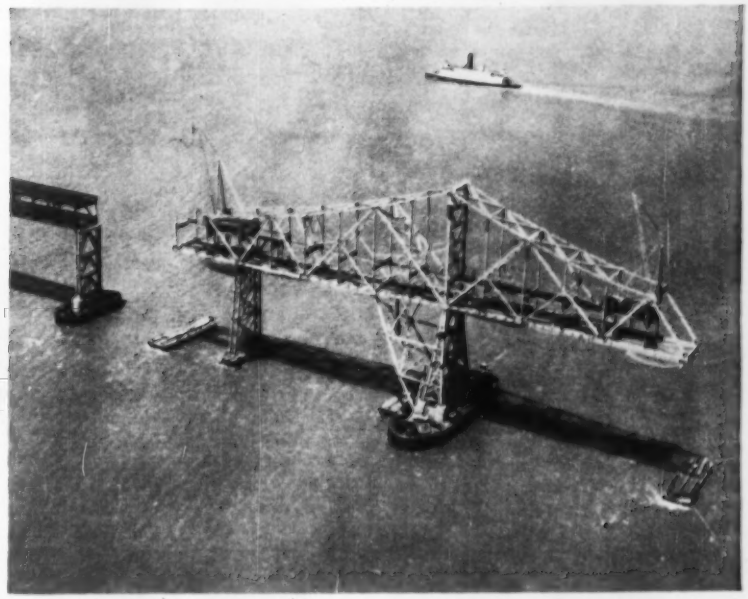
As has been reported in these pages before (ENR Nov. 4, 1954, p. 33), the 4-mile-long Richmond-San Rafael Bridge is composed of thirty-six 100-ft girder spans, thirty-six 289-ft truss spans and two cantilever spans. Each cantilever has a main span 1,070 ft long (providing a 1,000-ft clear ship channel) and two 535-ft anchor arms. Vertical clearance over the east navigation channel is 135 ft and over the west navigational channel, 185 ft from MHHW.

Construction of the bridge for the California Toll Bridge Authority is under direction of the Division of Bay Toll Crossings of the California Department of Public Works. The toll bridge eventually will have two decks, each carrying three lanes of unidirectional vehicular traffic. Only the upper deck will be open to traffic this year. The lower deck will be ready for traffic in 1957.

Erection feature of the cantilever spans is four reuses of temporary back span supports. Success of the work was made possible by careful planning on the part of the contractor—consulting engineer team (Earl & Wright, San Francisco consulting engineers, worked with Judson Pacific Murphy-Kiewit on this phase of the work).

• **Balanced erection method**—In formulating their course of action for cantilever span erection, JPMK officials first decided to use the balanced method of erection. In this process,





BALANCED ERECTION of the two cantilever spans featured a temporary shoring bent in the back span as well as an inclined strut supported by the cantilever tower.

construction started from one of the cantilever towers. The cantilever span and the back span were built out from the tower at an equal rate. A pace was established so that there would never be a 50-ton overload on one side or the other. And JPMK equipped the job to do one back span and one-half a cantilever span at a time. The same travelers and temporary bents were used four times. And in the process, half a cantilever span was left extending from its tower for three or four months at a time.

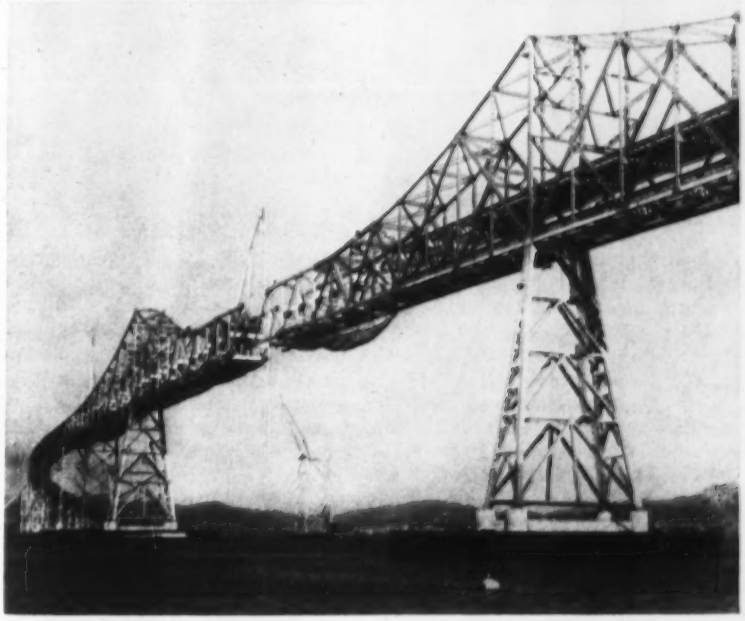
To accomplish this type erection, temporary support was needed in the twelve-panel anchor arm. First, a support was needed at the second panel point to permit erection of the two 55-ton capacity travelers that would be used to place the steel. And secondly, additional support was needed to permit construction of the complete 535-ft length of the anchor arm.

Support at anchor-arm panel point 2 was provided by an inclined shoring strut that was given vertical support by the tower pier and horizontal support by the tower itself. This was found to be more economical than a separate pile-supported shoring bent.

The inclined shoring strut was 138½ ft long for the east navigation channel where vertical clearance is 135 ft. After it was used for both sides of the east navigation cantilever span, an additional panel was added to the steel truss, making the inclined shoring strut 184 ft long. This length was used on the west navigation channel where vertical clearance is 185 ft.

The other anchor arm support was provided by a pile-supported shoring bent located at panel point 6. Cost studies proved this to be more economical than a shoring bent at panel point 4 or two shoring bents one at panel point 4 and one at panel point 8.

The shoring tower was supported on two clusters of eighteen 200-ft-long, 18-in.-dia pipe piles. The tower proper was 106 ft high for the first two uses and 156 ft high for the final two uses. As in the case of the inclined shoring strut, an additional panel of steel was added for the final two uses.



CANTILEVER SPAN was built half at a time. First half (right) was left extending 500 ft from its supporting tower while second half (left) was erected. During this time heavy storms hit, but did no damage to the half-built cantilever span.

Piles supporting the temporary shoring bent were driven in a 50-ft water depth as much as 150 ft into the underlying mud and clay. The piling penetrated into firm formations at least 25 or 30 ft. But the piles did not penetrate to rock in at least two of the four cases. However, there was no indication of settlement during construction.

As the piles were driven it was noted that the mud plug on the inside came up to within 10 ft of the mud level on the outside. This means that no plug was formed at or near the bottom that would prevent the mud from rising in the pile as it was driven, and that the stability of the pile depended upon skin friction. The top part of each pile was filled with

. . . Four miles of steel

rock to stabilize the clusters and reduce vibrations. After JPMK was finished with one shoring bent location, the piles were cut off at the mud line. This salvaged some 50 ft of length that could be reused on subsequent temporary piers by welding to other 18-in.-dia pipe.

• **Travelers erected**—After the inclined shoring strut was erected by use of a floating derrick barge, lower chord members spanning the first two panels of the back span were positioned. And enough diagonal members were added to make the assembly rigid. Then the floating derrick barge hoisted one of the 55-ton travelers to the lower chord. More back span steel was placed until it was possible to erect the upper floor beams in the first panel (the bridge will have two traffic decks). The traveler already in position then hoisted the second traveler to this set of floor beams. Next the lower part of the first two panels of the cantilever span was erected including a set of temporary middle chords. Upper floor beams were placed and the cantilever traveler moved out to the first cantilever panel. It then hoisted the anchor-arm traveler to the upper floor beams, turning it around in the process. With both travelers on the upper set of floor beams it was then possible for steel erection to proceed out from the tower. The travelers, of course, were not hoisted in one piece. Each time a traveler was lifted or turned around, it was necessary to do the job piecemeal.

The 55-ton travelers were designed specially for the cantilever erection work by American Hoist and Derrick Co. They are equipped with a 125-ft boom and 80-ft mast. The 55-ton rating is with a 50-ft reach. Power comes from a diesel engine working through a three-drum hoist. The rigs will operate at nearly full 360-deg radius, being prevented from lifting directly backward by the fixed struts supporting the mast.

Reason for so many traveler moves in getting the work under way is that the towers supporting the cantilever span are A-frame type. On some other bridges, towers supporting these towers have been frames at least one panel long with straight vertical truss legs that, in effect, provide a working platform on top from which work can start.

Steel erection proceeded on both cantilever and back spans at nearly uniform rates. When back span steel reached one panel beyond the temporary shoring bent, it was possible to remove the inclined shoring strut. And after full completion of the back span, it was possible to remove the temporary shoring bent. Most critical phase of the back span erection was just before anchor-arm completion. But no major difficulties were encountered.

When back span and cantilever span steel was completed, the travelers were dismantled. This was accomplished either by truck crane riding on the already completed bridge deck or by temporary gin pole.

Two sets of jacks were used to make the closing cantilever span members fit. One set was mounted on each of the final bottom chord closing members. The two 200-ton jacks on each member together with a 6-in. slotted hole made the closure seemingly simple. The jacking action had the effect of moving back the relatively flexible cantilever towers.

For upper chord closing, jacks were mounted on the upper chord member spanning between the cantilever arm and the suspended span—a member that under balanced load conditions has no stress. Here a 500-ton jack was mounted that had a leverage of three resulting in a 1,500-ton pull. Critical phase of the cantilever work, both in early steel erection and in jacking operations, was keeping in tension the eye-bar upper chord members spanning the first four cantilever span panels.

The Richmond-San Rafael Bridge is a project of the Division of Bay Toll Crossings of the California Department of Public Works, for which Norman C. Raab is project engineer. Ben Balala is resident engineer for the state on bridge construction with Howard Whitty serving as resident engineer specifically responsible for steel erection.

The $21-million steel erection contract is held by a joint venture of Judson Pacific-Murphy Corp. and Peter Kiewit Sons Co. In addition to project sponsor J. Philip Murphy and project manager Francis J. Murphy, key personnel for JPMK are H. W. "Bill" Ziegler—erection superintendent, R. H. Chisholm—yard superintendent and W. E. Dreusike—office engineer.

Consulting engineers for the joint venture are Earl & Wright of San Francisco, for whom George C. Haun supervised investigatoin of erection stresses and Alpo Tokoa represented the firm in the field.

New Experimental Fishway

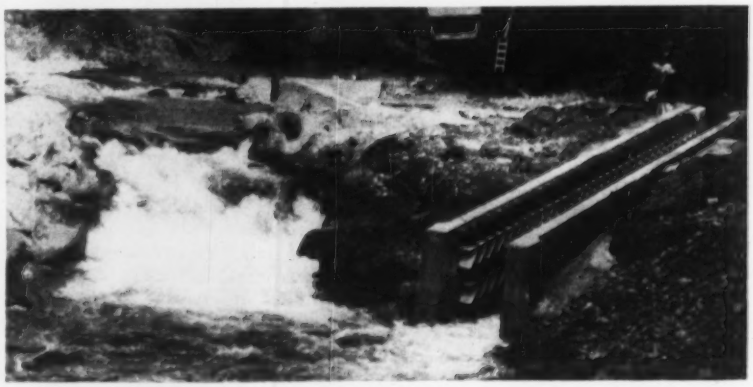
A new experimental fishway for passing salmon upstream around river obstructions has been installed on the Coweman River by the Washington State Department of Fisheries.

Although new here, the "Denil" is common in Europe. It is shorter and cheaper than the conventional pool-type fish ladder and makes fish passage possible over a wider range of flow variation. Its main advantage, like that of the Hell's Gate vertical baffle fishway used on larger streams, is in the elimination of manual operations. Pool-type fish ladders have a fixed operating range and will not pass fish at certain water levels unless the pool weirs are adjusted.

The Denil fishway is 30 ft long, 6 ft deep and has an interior wall-to-wall width of 3 ft. Bolted to the interior walls are six rows of sheet metal plates welded in a herringbone pattern and sectionalized for purposes of removal and repair. The interior width between baffles is 20 in.

Water current is broken up by the baffles into an easily-negotiated flow pattern, a function of their spacing and angle. No pools are necessary.

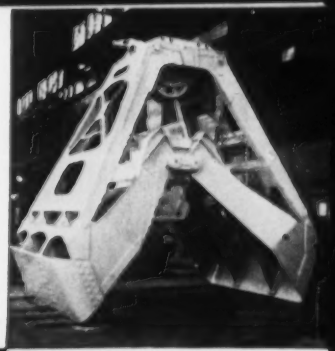
The Coweman falls normally would have been bridged by a pool fish ladder 48 ft long and 8 ft wide at a cost of $20,000. The Denil cost only $8,000, reports Robert J. Schoettler, director of the state department.



In ore clean-up buckets

FABRICATION SIMPLIFIED WITH USS "T-1" STEEL

(and weight reduced more than ½ ton)



This photo courtesy of Blaw-Knox Company.

HALF AS THICK! In the trays for giant ore clean-up buckets, 1¼" USS "T-1" Steel Plate, with a yield strength of 90,000 psi., replaces cast trays which were as much as 2½" thick. The new buckets—lighter in weight by more than half a ton — and expected to outperform the heavy cast trays, will be used at United States Steel's South Works.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION,
WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

• The trays of ore clean-up buckets must have phenomenal shock and abrasion resistance to hold up under constant scraping and scouring along the steel bottoms of ore boats. They are commonly made of heavy steel castings. But recently, Blaw-Knox Company, Pittsburgh, Pa., *fabricated* trays for several new buckets from USS "T-1" Steel Plate. This amazing new alloy steel assures the needed strength and durability, plus important fabricating advantages.

LESS WEIGHT — LESS EXPENSE

Biggest single advantage of fabricating from "T-1" Steel Plate is less weight. New trays weigh only 4,021 pounds each, compared to 5,068 pounds for comparable cast manganese steel trays. Thus, "T-1" decreases the weight of the bucket and reduces shipping and handling costs.

What's more, fabrication from "T-1" simplified the building of these huge buckets. It eliminated the expensive patterns needed for cast trays. Because "T-1" has tremendous resistance to impact abuse and abrasion, it is expected that it will outperform previously used materials.

For these ore buckets, "T-1" Steel is flame-cut to size, *cold formed* in a 1,250-ton press, drilled and then riveted to the bucket shell. "T-1" also can be welded—without pre- or post-heating. Because of its unusual combination of properties, it is cutting costs in many rugged applications.

LOOK AROUND YOUR SHOP

In your own equipment, or in the products you make for others—wherever you would like to increase service life . . . wherever you would like to reduce fabricating costs of heavy-duty parts—look into the possibility of using "T-1" Steel. Competent technical advice is always available, of course—free of charge—from United States Steel. Write, wire, or phone for complete information. United States Steel, Room 5212, Pittsburgh 30, Pa.

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS

UNITED STATES STEEL

Superb Achievement

OF 84 YEARS OF FINE INSTRUMENT MAKING

BERGER NEW BRONZE TRANSIT

Every now and then a product is developed which renders inadequate such overworked words as "quality" and "improvement." The new Berger Transit is just such a product. We believe it to be as fine an engineering instrument as expert design, skilled craftsmanship and superb materials can achieve.

You will observe, the first time—and every time you sight through its telescope—the clear, well-defined image—the precise stadia readings at greater distances made possible by its newly designed optical system. For example, the 6¼" Transit has a 26-power telescope with coated optics, a resolving power of 3½ seconds, effective aperture of 1.430 inches (36 mm.) and field of view of 1 degree, 6 minutes.

Smooth focusing is assured by the use of an integrated rear bearing and eye piece mount; the object is easily brought into sharp focus with a negative lens actuated by a fine rack and pinion, and with a slow, even motion.

Fully enclosed nickel silver leveling screws are precisely fitted into replaceable bronze bushings. The newly designed circle guard provides greater protection for the vertical circle and permits easy reading of the vernier. Non-reflecting finish of the compass plate reduces glare. Reversion vial is *standard at no extra cost*; choice of spider web or glass reticle.

These features added to the many other advantages for which Berger Instruments are recognized the world over, make this new model truly the "superb achievement of over 84 years of fine instrument making."

For a lifetime of accurate, trouble-free surveying, put yourself behind this newest Berger Transit. Ask us for complete details.

C. L. Berger & Sons, Inc., 45 Williams St., Boston 19.

Engineers' Transits
Builders' Instruments
Levels
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THE BEST IN SIGHT IS **BERGER**

ENGINEERING AND SURVEYING INSTRUMENTS...SINCE 1871

Optionals Are Necessary for This Plant

This rubber mounted, over-the-road, sand and gravel washing and screening plant is designed to meet a variety of operating conditions and product requirements—particularly close-to-roadside production sites. Designated the 512-VW, the plant is being offered with only the basic unit as standard equipment. Because of the many different requirements, the units necessary to meet local conditions and product demands are offered as optional items.

Designed to turn out two sizes and oversize gravel, and one size of washed sand simultaneously, the unit has demonstrated a production capacity of 340 tons per hour.

The basic unit consists of a 5′ x 12′ three-deck gradation screen, a 30″ x 25′ double-screw fines material dehydrator, a 30″ x 35′ on-the-plant feeder conveyor and an 18″ x 25′ and a 36″ x 25′ side delivery conveyor. Both side delivery conveyors can be attached to one side of the plant.

Even the optional equipment is mounted on rubber tires, with the exception of the mechanical feeder. Optional units are: a reciprocating plate (mechanical type) feeder, used when not feeding the plant directly from the delivery conveyor of the crushing plant; a ground feeder conveyor, mounted on cradle truck, used with the mechanical feeder; a coarse material dehydrator unit (or two, if needed), with a single-screw dehydrator and a single-deck buzzer screen; and conveyors for delivery of washed gravel from the coarse material dehydrator and washed sand from the fines material dehydrator on the main unit.

Various combinations of the units are possible. Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.

(*New Products continued on page 48*)

Vibrator Is Easy on Form

With the added advantage that it can operate off ordinary house current, a new motor-in-head concrete vibrator is said to go easy on forms for concrete work. Designated as Model EV25, the new model has vibration frequencies up to 10,000 vpm, but though the result is effective, it does not damage the form. Mall Tool Co., 7725 South Chicago Ave., Chicago 19.

BIG HEAD START ON DEADLINE WITH

FOSTER RENTAL STEEL—SHEET PILING

Checking Foundations with 120-Ton Load on H-Bearing Frames Anchored to Foster Piling

Hotel - Department Store - Parking Facility
THE DENVER COLORADO PROJECT

Contractors Webb & Knapp got a *Head Start* on this gigantic project by calling Foster for rental steel-sheet Piling, to complete four sumps (that were holding up the major excavation of this 400-foot square foundation). Foster delivered *on time*, the exact sections and exact lengths of steel-sheet Piling needed to get a head start on work schedules.

Foster 12″ x 53 lb. H-Bearing Piles driven an average depth of 50 feet, around perimeter of the gigantic 400 foot excavation.

Whatever You Need in Piling Call L. B. FOSTER for Service

- STEEL-SHEET PILING
- H-BEARING PILES
- LIGHTWEIGHT PILING
- PIPE PILES

FASTER from FOSTER

Write for Catalog EP-3

RAILS • TRACK EQUIPMENT • PIPE • FABRICATION

L. B. FOSTER CO.

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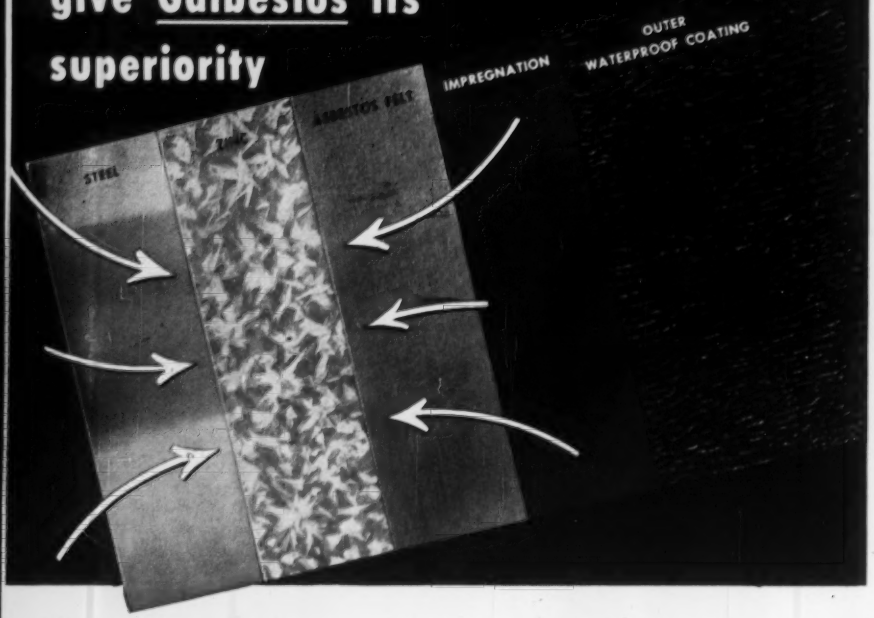
How molten metal helps give Galbestos its superiority



Robertson Galbestos has the greatest resistance to weather and corrosion of any protected steel roofing or siding obtainable anywhere. This position of broad superiority is made possible by a unique manufacturing process exclusive with H. H. Robertson Company.

First, the steel sheet is pickled . . . then given a coating of molten zinc. Asbestos felt is then pressed on so that as the molten metal hardens in cooling it grips the felt fibers in absolute bond. The asbestos is then impregnated with a special asphaltic compound and, finally, given a tough weatherproof coating. Galbestos can be furnished flat or in the 3 well-known corrugations: Standard, Mansard, and V-Beam. The resultant material is so durable, it may be sheared, bent, rolled, crimped and riveted in the field as easily as ordinary unprotected steel. It will withstand the greatest possible extremes in weather temperatures without deterioration, and will actually retard fire better than naked steel. For an industrial roofing or siding that requires no maintenance under the most severe corrosive conditions, specify Galbestos.

Long Service Life. Galbestos will give longer maintenance-free service under the most severe weather and man-made corrosive conditions. Even salt air cannot penetrate its tough coatings to destroy the steel core.

Not Fragile. Galbestos' strong steel core sheet guarantees against breakage—during shipment or during erection.

Resists Climatic Extremes. Galbestos is not subject to damage either by tropic or frigid temperatures. Its coatings will not run under broiling sun or crack or spall in sub-zero weather.

Goes Up Fast. The exclusive Robertson *Top-Speed* method of attaching Galbestos to structural steel speeds up erection for quicker occupancy.

Resists Flame. Leading testing laboratories have made exhaustive tests on the fire resistance of Galbestos and have published the results. Copies of these reports are available for study.

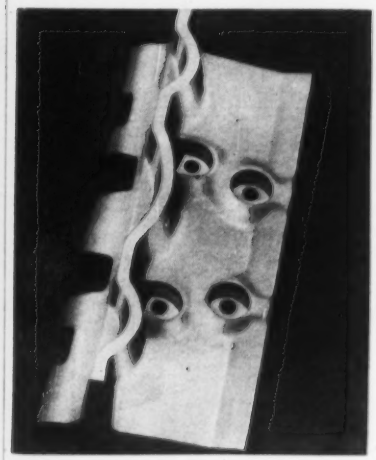
Robertson

Galbestos

a product of **H. H. Robertson Company**
2420 Farmers Bank Building · Pittsburgh 22, Pa.

In Canada: Robertson-Irwin Ltd., Hamilton, Ontario
In England: Robertson Thain Ltd., Ellesmere Port, Cheshire

. . . New Products



More Contact Surface With New Grouser Shoe

Addition of 15% more surface contact without increasing width of a new track-type tractor grouser shoe greatly increases flotation without traction loss; reduces sideslip and fishtailing; and increases life of tractor rail, frame, bushing and pin, according to its manufacturers.

Cast with a series of continuous curves, the manganese steel shoes are said to outlast conventional type shoes by two or three times. Advantages result, not only from increased area of the grouser, but also from reduction of unnatural side stresses.

The Gripper Grouser Shoe is available for Allis-Chalmers HD-19, HD-20 and HD-21 tractors in 24- and 26-in. widths; Caterpillar D7, D8 and D9 models in 22-, 24- and 27-in. widths; and International's TD-24 in 22-, 24- and 26-in. widths. Shunk Manufacturing Co., Bucyrus, Ohio.

Crane Mounting System Ends Servicing, Adjustment

With the system already incorporated as standard equipment on two 25-ton models, the Thew Shovel Co. is hailing a new method of attaching shovel-crane turntables to crawler or rubber-tired mountings as a major change in the industry.

Dubbed the "shear-ball" mounting, the system is said to eliminate the need for top or hook type turntable rollers, center pins and nuts, exposed roller paths, along with maintenance and adjustments. The mounting is in fact a continuous circle of hardened steel balls, sealed in a precision-ground race, which is both the means of attachment of the turntable and the carrier and the rolling surface for revolving the turntable.

Under development for seven years, the attachment is now standard equipment on two Lorain crane models, and is available as optional equipment for others. More effortless swing plus longer, trouble-free operating life are added advantages. THEW SHOVEL CO., LORAIN, OHIO.

Rolling Barrel-Heater Warms Liquids in Shipping Drums

Job-site warming of liquids in their own shipping drums is the special purpose of a new portable barrel-heater.

One man can load and operate the steel-wheeled 200-lb apparatus, according to the manufacturer.

Fired by either kerosene or bottled gas, the device utilizes baffles to distribute heat uniformly over the entire drum surface, thus minimizing the danger of spot overheating and flash fires. A temperature indicator for the heated liquid and bung agitators for proper venting add further safety as well as convenience.

The heater is shipped completely assembled. TARRANT MFG. CO., 27 JUMEL PL., SARATOGA SPRINGS, N. Y.

Pocket-Size Amplifier Hears Termites at Work

Transistors make possible this audio-amplifier which is so small it can be put in one's pocket and so sensitive it can detect termites, fluid leaks in pipes and defective bearings or other moving mechanical parts. Amplification is provided by three miniature, hermetically sealed low-noise transistors. The device is powered by a dry-cell battery good for 100 hours of use.

Only 4 x 2½ x 1¾ in. and weighing 15 oz., the sound and leak detector is complete with a leather carrying case. FISCHER RESEARCH LABORATORY, INC. 1961 UNIVERSITY AVE., PALO ALTO, CALIF.

Penetrating Surface Coat Boasts Longer Form Life

A product, which the manufacturer claims increases the life of wooden concrete forms, produces clean, smooth concrete surfaces and prevents adherence of concrete, mud and water, is now available.

Applied by roller, brush or spray, the penetrating coating is said to be unaffected by scratches or mars due to handling and does not need scraping or coating after each casting operation. One application of "Form Kote" is effective for an average of four operations. FORM KOTE, INC., 700 W. VIRGINIA ST., MILWAUKEE 4, WIS.

PRESSTITE
No. 99*
THE TOUGHEST, MOST ECONOMICAL SEALER AVAILABLE for AIRFIELD PAVING JOINTS
■ Resists being BLASTED OUT by terrific jet engine thrust.
■ Resists MELTING and BLOWOUT from super-elevated temperatures from jet after-burners.
■ Resists SHOCK and IMPACT from heavy aircraft.
■ Unaffected by jet fuel spillage.
WRITE for illustrated copy of Bulletin 99
■ A Two-Component, Cold-Applied Sealer
■ For Sealing Sawed and Formed Joints
* Meets Federal Specification SS-S-170, 23 May 1955
Also Presstite No. 77 cold-applied non-JFR joint sealer.
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Manufacturers of Sealing Compounds Exclusively Since 1924
PRESSTITE ENGINEERING COMPANY
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MAKES BETTER—MORE WORKABLE MORTAR!

Get snug, tight, neat joints!

Use MORTITE in *any* mortar, *anywhere*, under *any* conditions. It produces a smooth "buttery" mix with a minimum of water.

Dry mortars are frequently too stiff to be workable. Poor compactness and poor adhesion can result. Truscon MORTITE improves the workability without the addition of detrimental excessive mixing water!

Truscon MORTITE provides greater plasticity which allows time for smooth positive trowelling and "striking-off" of the joints. Less time and effort and lower costs result.

Specify and use MORTITE for better mortar at lower initial cost and long range savings in repointing costs!

Send coupon below to Truscon Laboratories. Learn how MORTITE has produced results for leading engineers and contractors on major projects all over America and the world.

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City_____ Zone____ State____

Color and Glitter Add To Looks of Asphalt Coating

A colored, aluminum-pigment, asphalt-base coating, Ore-Ite, is now available for waterproofing, protecting and decorating water towers, oil storage tanks, concrete and masonry block walls, etc. Marketed in six colors, Ore-Ite may eliminate the need for hot tar when used as a roof coating.

Pigmentation is in the form of tiny aluminum flakes rather than granules. In an applied coat, the aluminum flakes are said to float themselves into overlapping parallel layers, five to ten flakes deep—providing a reflective surface, protected and bounded by waterproof, airtight, asphalt-base vehicle.

Applied by spray, brush or roller, without prime coat, the product is reputed to be flexible enough to accommodate temperature changes without cracking.

Price is $8.95 per gallon. DUNCAN-STEWART INDUSTRIES, LTD., 715 FIFTH AVE., NEW YORK, N. Y.

Automatic Batch Plant Line Increased to Three Models

As a result of successful operation of its 4,000-lb bituminous "Batch-Omatic" line in the United States, Canada and Cuba, the Barber-Greene Co., has announced availability of the automatic plants in 2,000-lb and 6,000-lb models.

The newly announced units, like the 4,000-lb model, are said to employ features of simultaneous weighing of all sizes of aggregate, instant changeover from fully automatic to manual operation, the "Dyna-Mix" pugmill and positive inspection of aggregate gradation and weight. BARBER-GREENE CO., AURORA, ILL.

New Products Briefs . . .

• **A breakage-resistant masonry blade** is announced that features 3-ply fibre glass reinforcing for increased safety in abrasive cutting. The new reinforcing is found in the complete line of new "Tuffie" blades, which also feature friction-free sides. It is stated that the new design increases the range of materials that can be cut. EVERREADY BRIKSAW CO., 1509 S. MICHIGAN BLVD., DEPT. 241, CHICAGO 5, ILL.

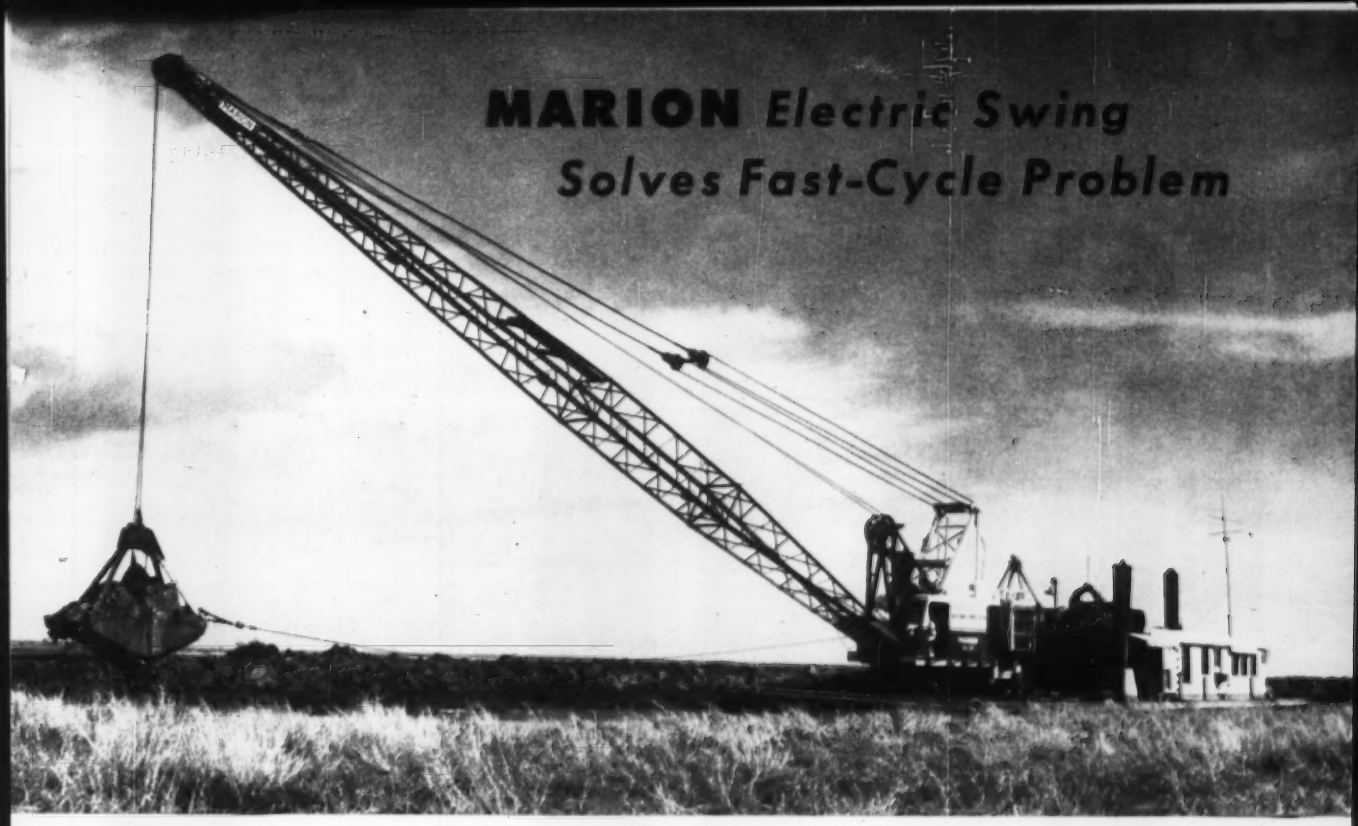
• **75-Ton heavy lift crane**—A new machine designed primarily for heavy lifting has been announced by the Marion Power Shovel Co. Its top basic rating is 75 tons at 12-ft radius with a 50-ft boom. Major design features include extra crawler width; alloy steel lower frame, axles and crawler frames; double hook rollers and a third drum that can be used as an auxiliary take-off or as a high-speed boom hoist. The new crane is designated model 87-M. MARION POWER SHOVEL CO., MARION, OHIO.

Not a Cable In Sight

An all-hydraulic dipper-stick type shovel was recently introduced in Duesseldorf, Germany. Truck or track mounted, the unit is said to be about one-third the weight of conventional models. German Demag Dredger Manufacturers, Duesseldorf, Germany.

• **Two new transmissions** that are 2½ in. shorter and 60 lb lighter than their predecessors are convertible to overdrive models through replacement of only five parts, according to manufacturers. Both transmissions (Road-Ranger R-96 and F-960) provide 10 forward speeds and two in reverse, with advantages of one-lever operation, pre-selected automatic all-air range shifts and faster road speeds. FULLER MFG. CO., KALAMAZOO, MICH.

• **Short-stroke, 12.5 hp engine,** designed for heavy-duty farm, construction and industrial applications, has been added to the line of the Kohler Co., Kohler, Wis. Claims are that the short-stroke cuts engine friction more than 30% and increases piston ring life by more than 50%. The new air-cooled, single-cylinder, four-cycle unit weighs 175 lb and delivers optimum hp at 3,200 rpm. KOHLER CO., KOHLER, WIS.



Owner Calls 111-M "the first machine . . . 100% Satisfactory for barge work."

Swinging 5 to 6 yard loads of heavy clay every 30 seconds invites swing clutch problems on conventional clamshells. One Louisiana contractor who had spent 30 years in the business turned to MARION for the answer—and got it!

A five-yard Marion diesel clamshell with electric swing provides the speed and power for fast cycling of big loads in difficult digging (the marsh clay weighs 2800 lbs./yd.) Freed of clutch heat worries, the owner calls the Marion 111-M "the first machine I think is 100% satisfactory for barge work."

A third drum on the Marion provides a means of travel. The operator casts the clam bucket far ahead and uses the third drum to pull the barge forward at a speed of 7 miles per hour.

This machine moved 1,150,000 yards digging 23 miles of canals 34 feet wide and 10½ feet deep in a large marsh 65 miles south of Lake Charles, La. The work is part of a state wild life program to encourage wild ducks and geese. The canals make the area accessible by boat, and the spoil banks help ward off salt water.

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency.

MACHINE	SHOVEL CAP. CU. YD.	MAX. CRANE RATING IN TONS @ 12' RAD. EXCEPT AS NOTED CRAWLER	TRUCK	WAGON	HOE CAP. CU. YDS.	ASK FOR BULLETIN NUMBER
MARION 32-M	¾	*17½	*25	*25	¾	416
MARION 43-M	1	*27	*35	— —	1 1¼	415
MARION 362	1½	37	— —	— —	1½ 2	398-D
MARION 372	— —	43	— —	— —	— —	— —
MARION 83-M	2	60	— —	— —	2 2¼	414
MARION 87-M	— —	75	— —	— —	— —	— —
MARION 93-M	2½	80	— —	— —	— —	397-E
MARION 101-M	3	84	— —	— —	— —	417
MARION 111-M	4	169	— —	— —	— —	402-B

*Rated at 10' Radius in Accordance with General Practice.

MARION POWER SHOVEL CO.

MARION, OHIO, U. S. A.

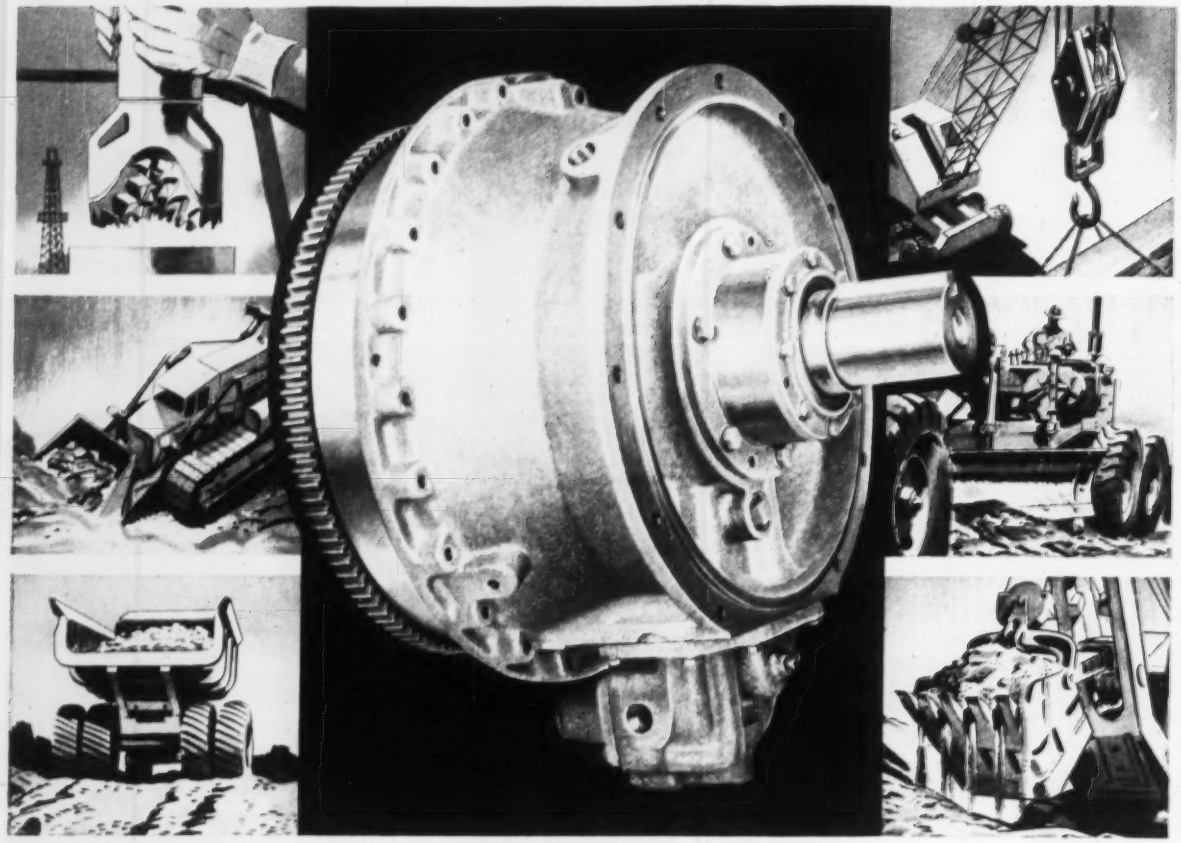
Please send me Bulletin 402 on the Marion 111-M.

Name ..... Title .....

Company .....

Address .....

City ..... State .....



Versatile is the word for the Torqmatic 500

NAME the gasoline- or Diesel-powered equipment you buy or build in the 100 to 350 horsepower range and it's a sure bet that it's available—or will be soon—with the Series 500 TORQMATIC, *the world's most versatile torque converter.*

Scores of manufacturers—making such varied equipment as cranes, shovels, drilling rigs, log loaders, ditchers, industrial locomotives, scrapers, graders and off-highway trucks—specify the TORQMATIC 500 in the equipment they build, and with good reason.

In one standard housing it gives them a choice of 4 ranges, 7 torque ratios—*and* permits operators to standardize on *one* type of converter for *all* their equipment within the horsepower range.

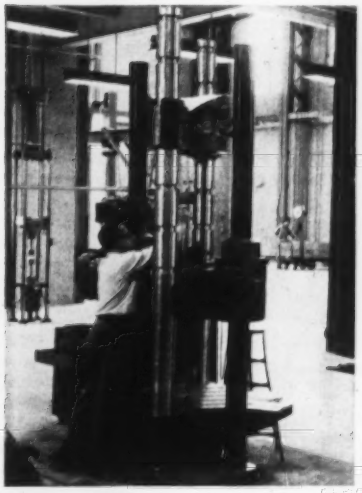
In many applications it permits the use of lower horsepower engines with no reduction in *working* power because the TORQMATIC 500 multiplies engine torque anywhere from 250% to 360%—*and* means equipment owners will cut operating costs and get more work done per shift.

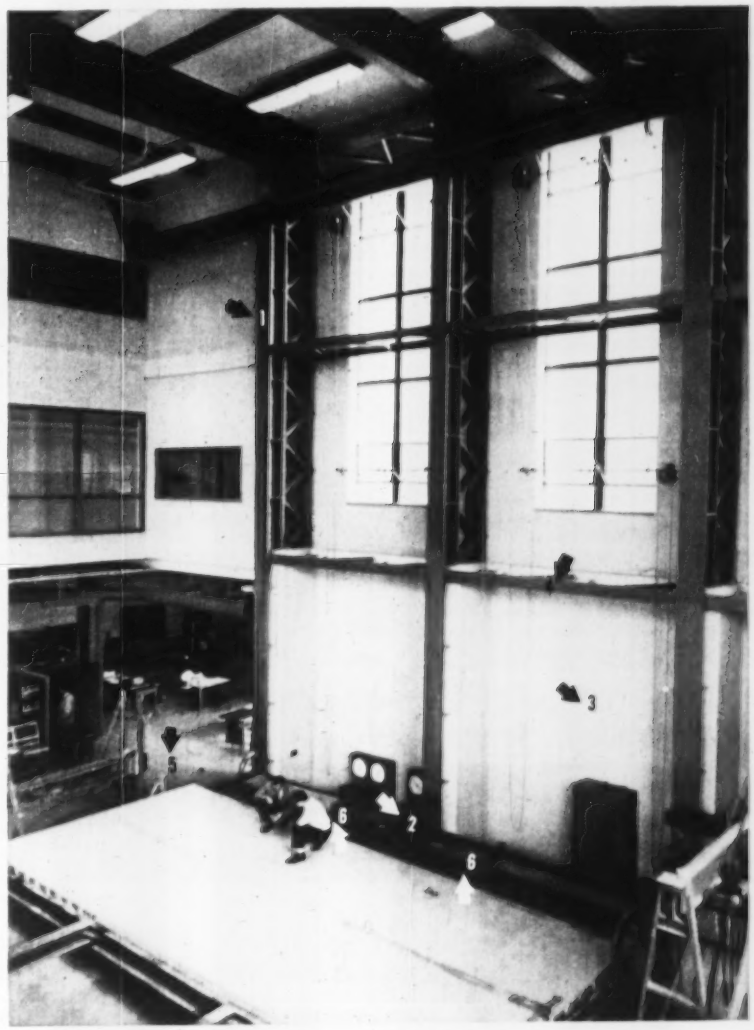
For full details on the Series 500 TORQMATIC Converter in your equipment write to:

Allison Division of General Motors
Box 894E, Indianapolis 6, Indiana

GM TORQMATIC

Allison ★ **TORQMATIC DRIVES**





Like the frame of the testing machine above, the building for Cornell's new structural laboratory takes the loads of full-scale tests. It has . . .

1. Heavy laced columns for three-dimensional loadings.
2. Column-fastened tie rods connected to bedrock anchors for increased loadings.
3. Thick concrete walls that can also take lateral loads.
4. Horizontal trusses for lateral stability.
5. An 18-in.-thick concrete floor slab.
6. Two movable 100,000-lb jacks to apply loads at any location.

Laboratory Built for Full-Scale 3-D Testing

Cornell University's new structural testing laboratory is an engineering professor's dream come true. Here, loads can be applied to full-size structures from floors, walls and overhead in any desired direction.

Filling one wing of the university's new Thurston Hall, the lab has a main bay 55-x 60-ft by 40-ft high—large enough to handle full-scale bridge and airplane components. A connecting lower wing, 17 ft high, makes it possible to test structures running up to 90 ft long.

Eighteen-foot-high, 12-in. thick concrete-walls span the 15-ft distance horizontally between heavy, laced columns that support the roof. These columns are designed for a vertical downward load of 750 kips at any point, a vertical upward load of 50 kips at any point, and a horizontal load of 50 kips in any direction within the lower 18 ft of the columns. The upward load can be increased to 250 kips by tying the columns to nearby anchors that reach down into bedrock. Since the tie rods slope at a 45-deg angle, fastening the columns to the anchors also results in increase of the load that can be applied horizontally to the column.

• **Concrete reaches to bedrock**—To take downward loads the hall is floored with 18 in. of reinforced concrete that can withstand a load of 100,000 psf. The center portion of the floor, about 20-ft square, is concrete all the way down to bedrock, thus making it capable of taking almost any desired load.

Loads applied from overhead will be taken by a steel box-girder reaction beam that is yet to be installed. It will span the building in the 55-ft direction and will be movable, so that it can be connected to any column pair at any level. It can also be tied down to the rock anchors, and if so tied, can resist a total upward reaction of at least 1,000 kips.

There are twenty-seven 3½-in. round and 30-ft long alloy steel anchors

Lever House Weatherproofed with THIOKOL-Based Glazing Compound

Due to the differing expansion rates of metal and glass, and the constant channeling of rainfall at the joints, the original glazing compound used in Lever House did not produce the desired effect.

Faced with a severe leakage problem, the Building Service Director chose Tremco "Lasto-Meric", a compound based on "Thiokol" Liquid Polymer, as a suitable established replacement.

His choice was made on the basis of the performance of "Thiokol" Liquid Polymer — a solventless liquid that converts entirely to a rubber at room temperature and insures a tenacious, durable seal even after years of weathering. It maintains resilience and adhesion from 250° above to 65° below zero.

Investigate "Thiokol"-based materials before you specify your glazing or caulking compound and save costly future replacement. Information on this case will be sent to you on request. WRITE: THIOKOL CHEMICAL CORPORATION, 784 North Clinton Avenue, Trenton 7, New Jersey. IN CANADA: Naugatuck Chemical Div., Dominion Rubber Company, Elmira, Ontario.

Thiokol Chemical Corporation manufactures "Thiokol" Liquid Polymer only as a raw material. The Tremco "Lasto-Meric" is a product of Tremco Mfg. Corp., Cleveland, Ohio.

Skilled mechanic of the Grenadier Corp., NYC, pressure calks "Lasto-Meric" into joints and then tools it into place with a spatula.

Thiokol®

PIONEER MANUFACTURERS OF SYNTHETIC RUBBER

(90,000-psi yield strength) that extend into the sloping bedrock layer a distance of 18 to 26 ft. Each of the anchors can take an upward pull of 200,000 lb.

Projects are already being carried out in the new test chamber. Prof. George Winter, head of the department of structural engineering, is testing light-gage steel structures under conditions that simulate wind and earthquake loadings. Full-size light-gage steel floor decks, measuring up to 12 by 30 ft, have been tested with and without concrete fill, with different welded connections, and with and without acoustical perforations. Conditions simulating horizontal earthquake forces are produced by "loading cells" mounted on the walls and columns.

Other projects currently underway include tests of light-gage steel structures with bolted connections to find the effects of varying plate thicknesses and different bolt arrangements, plus an experimental study of a full-scale pressure vessel by Prof. E. T. Cranch to confirm calculations of Prof. P. P. Bijlaard.

The general design, including dimensioning, of the main testing bay was carried out by Dean S. C. Hollister and members of the structural engineering department, School of Civil Engineering, of which Prof. George Winter is head (shown at testing machine in photo).

Load-Transmission Test For Flexible Paving

A number of base-course materials used in concrete pavement construction have been evaluated by load-transmission tests. And the findings have been correlated with triaxial test results by the Civil Aeronautics Administration.

CAA Technical Development Report No. 269, a complete report of this research, has just been released to industry through the Office of Technical Services, U. S. Department of Commerce.

The result of pavement quality on sub-grade pressures was studied at 24-in. depth. And pavement composed entirely of sand proved weakest in load transmission tests. Clay-gravel composition was slightly better, normal gravel was intermediate in strength, while crushed slag and limestone, with sharp angular particles, showed up well.

The report concludes that angular coarse-graded materials are effective in lower levels because of the confining action with the surface.

W. E. Kelley

A. A. Strelsin

W. E. Kelley Named President Of Kidde's Nuclear Firm

Wilbur E. Kelley, former manager of the New York operations office of the U. S. Atomic Energy Commission, has been elected president of Walter Kidde Nuclear Laboratories, Inc., Garden City, N. Y., an atomic research, development and engineering firm.

Kelley, who started his career with the Corps of Engineers, was one of the first engineers to become associated with the Manhattan District atomic development program and was in charge of the New York office of the AEC for six years following World War II. Since 1953, he has been vice president in charge of engineering for Catalytic Construction Company of Philadelphia, designers and builders of plants for the petroleum and petrochemical industries.

Walter Kidde Nuclear Laboratories, formed in 1952, was among the first privately financed concerns to enter the nuclear energy field on a commercial basis.

Alfred Strelsin Will Head Merged Construction Firm

Alfred A. Strelsin, former board chairman of McWilliams Dredging Company, has been named president of the newly formed Williams-McWilliams Industries, Inc., New Orleans, La., following merger of the McWilliams Dredging Company and W. Horace Williams Company.

The New Orleans engineering and construction firms retain identity as divisions of the new company.

The Williams division is headed by Robert E. Gosa, former president of the Williams company and now executive vice president of the new firm. Leslie R. Thornton, who was head of the McWilliams company, is vice president in charge of the McWilliams division.

H. H. Rappaport Forms New Construction Firm

Herman H. Rappaport, who recently resigned from McDonald Brothers, Los Angeles engineers and constructors, has formed the Rappaport Construction Company.

With temporary headquarters in Torrance, Calif., the firm is organized on a task group basis to handle complex projects and will serve heavy industry. It will specialize in tilt-up and prestressed concrete construction as well as engage in construction of the more conventional type.

Prior to his work as engineering construction manager of factory construction for the McDonald firm, Rappaport was associated with the atomic energy program at Oak Ridge and participated in the development of both the synthetic rubber program and aviation gasoline catalytic crackers.

H. K. Ferguson Subsidiary Opens Toronto Headquarters

The H. K. Ferguson Company of Canada Ltd., industrial designers and builders and a subsidiary of H. K. Ferguson Co. of Cleveland, Ohio, has established its headquarters in Toronto, Ontario.

John B. Essery, a native of Toronto,

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- Pressure Vessels
- Wind Tunnels
- Crane Bridge Girders
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DRAFTING TRENDS

At Universal Oil Products Company, Chief Draftsman M. F. Perkins checks the working qualities of Post pencil cloth with Joe Mania of the Drafting Division.

More drafting rooms use pencil cloth for ink-like lines at pencil speed

We've noticed that more and more drafting rooms are using pencil cloth for important originals. (We're particularly interested because Post was the first U. S. manufacturer of pencil cloth.)

While cloth is naturally more expensive, many draftsmen feel that the cost is nominal compared with the expensive time and effort that goes into an original drawing. They feel that paying a little more for the *durability* of cloth is a common-sense investment.

For speed and ease of working, pencil cloth is probably the best medium of all. Many draftsmen use it for drawing, primarily because of its easy working matte surface and good erasability. At pencil speed, it gives a jet black line with density approaching ink. Reproduction from pencil cloth is consequently very good—sharp and precise with excellent contrast.

Two good examples of recent improvements in pencil cloth are Post's *Whitex* and *Penciltex* (blue tint). Both are available in either regular or smooth surfaces for different degrees of pencil hardness. The texture is precisely formulated for dense, opaque lines at high drawing speeds. All are moisture-resistant and highly transparent.

The most popular feature of *Whitex* and *Penciltex* is the unusual erasability. Even 6H pencil lines erase without "ghosting". Just as important, they hold up well after working and reworking in one place. Our researchers are constantly testing different tracing cloths and they tell us that *Whitex* and *Penciltex* have the finest erasing qualities of all leading cloths ■

New mathematical chart

A new chart called "Calculine" performs multiplication, division and logarithmic problems quickly and accurately. The chart is furnished on 8½ x 11″ heavy card stock with grid lines and diagonals printed in green. Engineers can use it in the office or in the field, computing with one hand while the other is free. There are no delays involved making time-consuming settings. After numerous experimental designs, "Calculine" was devised by E. J. George, an engineer at Sun Oil Company, for students in his courses at Drexel Institute. The charts are distributed exclusively by Post.

Further information on these items is available from the Reader Service Division of the Frederick Post Company, 3651 N. Avondale Avenue, Chicago 18.

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ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE

. . . Men and Jobs

has been named contract manager. Formerly associated with Chemical Construction Corporation, he has been active in the engineering and construction field since the war.

W. M. Thompson, president of the parent organization, heads the Canadian company.

State Hygiene Engineer Joins Industrial Firm

Harry E. Seifert, former director of the Bureau of Industrial Hygiene of the Virginia Department of Health, has joined Lightweight Aggregate Corporation, manufacturer of Solite in Virginia and the Carolinas, as head of the company's new process engineering division. The division will market a process designed to control industrial air pollution.

A civil engineering graduate of Rensselaer Polytechnic Institute with a graduate degree from Columbia University, Seifert has spent most of his professional career in state and federal service. He was with the U. S. Public Health Service for 16 years, serving as an industrial hygiene consultant and as chief of the engineering unit of the Division of Industrial Hygiene. For the last six years he has been associated with the Virginia Department of Health.

Western Firm Appoints New Production Manager

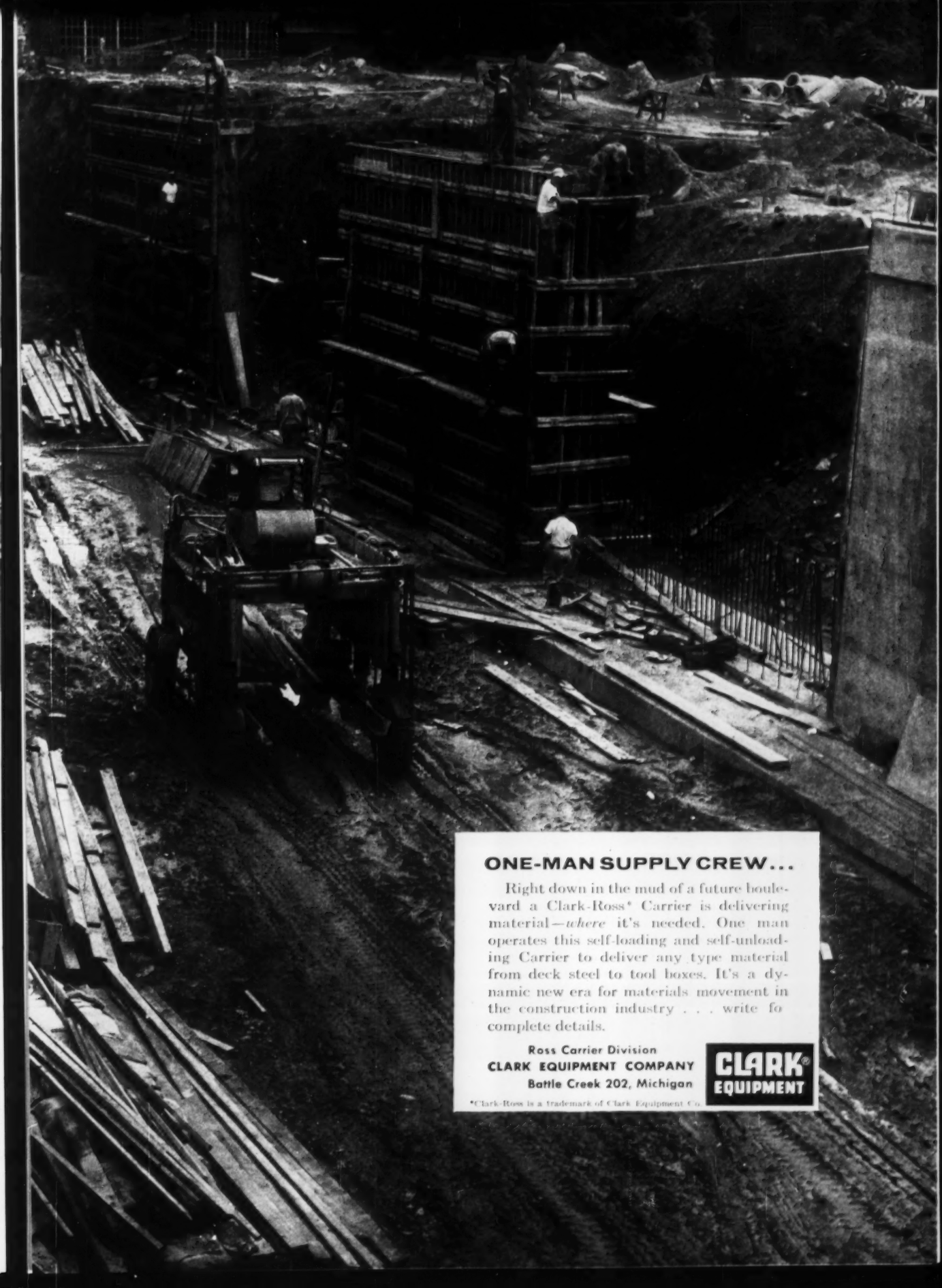
Leslie A. Irvin, civil and structural engineer, has been appointed production manager for Daniel, Mann, Johnson & Mendenhall, architects and engineers, Los Angeles, Calif.

A graduate of the University of California, Irvin has been identified with the design and construction of a number of prominent industrial projects in the west, including manufacturing plants for Revere Copper and Brass, Lever Brothers, Kaiser Steel and Johns-Manville.

Among the projects with which he will be associated as Los Angeles production manager are new schools for 30 districts in the southwest, 56 new supermarkets in California and various miscellaneous military installations both here and abroad.

Men and Jobs Briefs

• **Associations**—The National Association of Home Improvement Contractors elects **Joseph I. Sargon** of Allston, Mass., as president . . . **Fred E. Blair** of Denver, owner of the Blair Engineering Company, is named president of the Colorado Society of



ONE-MAN SUPPLY CREW...

Right down in the mud of a future boulevard a Clark-Ross* Carrier is delivering material—*where* it's needed. One man operates this self-loading and self-unloading Carrier to deliver any type material from deck steel to tool boxes. It's a dynamic new era for materials movement in the construction industry . . . write fo complete details.

Ross Carrier Division
CLARK EQUIPMENT COMPANY
Battle Creek 202, Michigan

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*Clark-Ross is a trademark of Clark Equipment Co.

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A CATALOG
for every Grating

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. . . Men and Jobs

Engineers . . . **Leslie M. Clauson** of Ames, Iowa, deputy chief engineer of the Iowa state highway commission, is chosen president-elect of the Iowa Engineering Society . . . **E. H. Johnson,** city building inspector at Durham, N. C., is elected president of the North Carolina Building Inspectors Association.

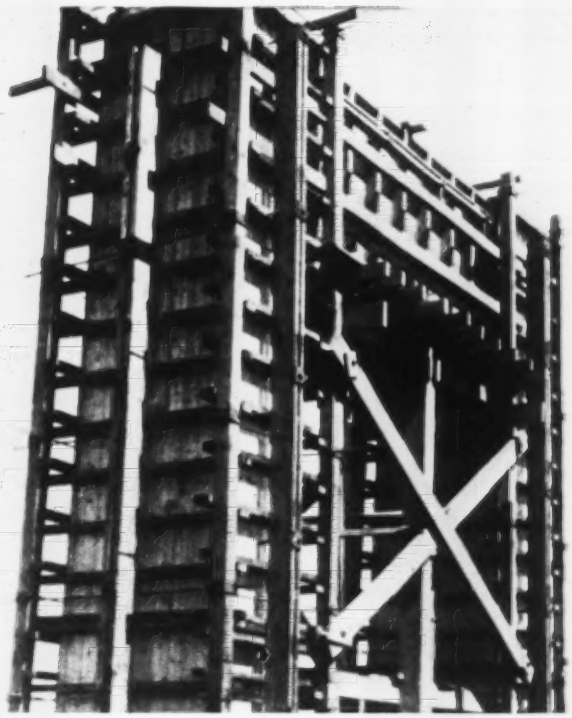
• **Careers**—The Department of the Interior appoints **Arthur A. Baker** as associate director for the Geological Survey . . . **Lyman C. Lovell** is named director of public works for Hartford, Conn., succeeding **Charles W. Cooke,** who will become director of the Park River Flood Control Commission.

• **Business**—The McLean Contracting Company, Baltimore, Md., elects **Frank B. Beasman** chairman of the board and **Edward P. Coblentz** president . . . **Albert S. Bynum** joins the Baytown, Texas, consulting engineering firm of W. D. Broyles, which will now be known as Broyles and Bynum . . . **Ambrose C. Martinsen** is appointed chief project manager for the Engineering Division of Catalytic Construction Co.

Baltimore Contractors, Inc., of Baltimore, Md., appoints two new vice presidents: **Paul E. Tignor** and **Albert C. Klingenberg** . . . Frederic R. Harris, Inc., New York consulting engineers, opens a branch office in New Orleans with vice president **Eugene H. Harlow** in charge . . . **Ferdinand Leiser,** co-founder and president of Christie & Leiser, Inc., building contractors, joins Kulm, Smith & Harris, Inc., New York, building contractors, as vice president, and will have charge of industrial construction.

Pantech Inc., a consulting engineering subsidiary of Pittsburgh Pipe Cleaner Company, Pittsburgh, Pa., appoints **W. B. Hart** as director of its Industrial Wastes Engineering Division . . . **Daniel J. Weiner** rejoins the staff of Haskins, Riddle and Sharp, Kansas City consulting engineering firm, after two years of duty in Indo-China with the United States Public Health Service.

Malan Construction Corp. of New York appoints **William T. Dickey** to its engineering staff. Dickey will supervise construction of Malan projects in Ohio and adjoining states . . . **Geves G. Kenny** joins the staff of Roadway Express Inc., of Akron, Ohio, and will serve as director of terminal design and construction.



Use of Richmond Adjustable Tyscrus and Lagstuds on This Pier Job Saved the Contractor Money.

Concreting Delays Eliminated by Richmond Lagstuds

Adjustable Tyscru System Means Increased Profits for Contractors

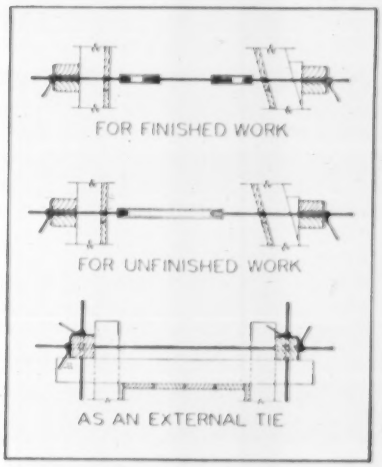
Forced by stiff competition and rising labor costs into closely examining operating techniques, experienced contractors in heavy construction have succeeded in reducing many operational expenses. This has been accomplished by improved techniques and, in large measure, by carefully calculating on-the-job needs and ordering materials and equipment to definite specifications. Yet in most construction areas certain problems must still be solved right in the field. While it is possible in concrete form work, for example, to predetermine accurately 80% to 90% of the tie needs on a job and to order specific sizes, the remaining 10% to 20% present special, unforeseeable conditions. These "specials" were long a headache.

Richmond Continuous Threaded Lagstud

The Adjustable Tyscru System was developed by Richmond for just such emergencies. In the past when special conditions in concrete form work called for a non-standard tie or special rod, the contractor was faced with several alternatives. Once the size was ascertained he could order it from the factory—which meant costly delay; or by using the she-bolt system he could have an inside rod cut and threaded in his machine shop—which also meant that his crew was held up until the piece was finished. Of late years, however, he has been able to use Richmond Continuous Threaded Lagstuds which, combined with Tyscrus, eliminate such delays in operations. By simply cutting a Lagstud to the desired length right at the form, the needed piece is immediately available. The time saved in uninterrupted operations means substantial economies on the job.

Already in wide use by leading contractors, the Richmond Continuous Threaded Lagstud substitutes preparedness for guesswork in planning a job. With a supply of Lagstuds and some miscellaneous Tyscrus on hand, any foreman can quickly and easily assemble a tie to the exact specification. Most versatile of the Richmond Tyscru family, since it can be utilized in scores of combinations with any of the Tyscru products, the Continuous Threaded Lagstud has been used for emergency bolt requirements, for adjustable anchorages in rock or concrete, or—with Lagnuts—for bolting forms together.

The accompanying diagrams illustrate the adaptability of the Richmond Continuous Threaded Lagstud. They are available in $\frac{1}{2}$", $\frac{3}{4}$", 1" and $1\frac{1}{4}$" diameters, threaded to fit the contour of the helix coil of the Tyscru.



Safe load rating is equal to that of Tyscrus of the same diameter. Obtainable in 5'-0" standard lengths or cut to length as required.

The entire Richmond Adjustable Tyscru System—Adjustable Tyscrus, Continuous Threaded Lagstuds, Lagnuts and Handle Lagnuts—is described in the 1955 Richmond Catalogue. Write for your copy. Or if you have specific concreting problems Richmond's Technical Division or field men will be glad to lend a hand. Write: Richmond Screw Anchor Company, Inc.—816 Liberty Ave., Brooklyn 8, N. Y. or 315 South Fourth St., Saint Joseph, Mo.

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hydrostatic head
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Karnak Fabric is non-sticking, unrolls easily to the very end . . . works faster with no waste. It is packed in sturdy corrugated cartons for protected shipping and storage. Available through waterproofing contractors, or distributors or write us for information. ***Made by Lewis Asphalt Engineering Corp., 30 Church St., New York 7, N. Y. Dept. 212***

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Obituaries

Gavin Hadden, 67, who had served most recently as a civil engineer, Department of Defense, Washington, D. C., died March 10. Prior to joining the federal government in 1940, Hadden was in private practice for 21 years. He designed and co-designed many athletic stadiums including those at Cornell, Northwestern, and Philadelphia's Franklin Field. He also was consultant on various airport projects; and inventor and co-inventor of the crescent-type stadium; rolling grandstands; trajectory-type indoor tennis courts.

W. F. Burgess, 65, retired supervisor of bridge construction for the North Carolina Highway Department, died March 6. He had served with the highway department since 1931.

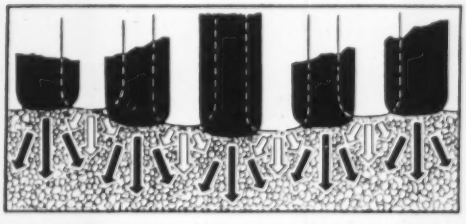
John A. Elliott, 69, Texas division engineer with the Bureau of Public Roads for 18 years, died March 3. A civil engineering graduate of Washington University, Elliott joined the bureau in 1918 and was district engineer at Denver, Col., from 1933 to 1938.

George A. Moulton, 63, civil engineer who served a long career with various railroads including the New York Central, died recently in Maryland. He also served with the Federal Bureau of Public Roads on the Skyline Drive in Virginia and the Alcan Highway in Alaska.

James T. Ganson, 69, retired civil engineer, died March 8 at Buffalo, N. Y. A graduate of Rensselaer Polytechnic Institute in 1911, Ganson started his own contracting business before becoming an engineer with H. F. Stimm Construction Co., of Buffalo.

Francis Blossom, 85, partner in Sanderson & Porter, engineers and constructors of New York, died March 12. A civil engineering graduate of Columbia University in 1891, Blossom was engineering department manager of Westinghouse, Church, Kerr & Co. from 1893 to 1899. He then joined Sanderson & Porter and over the years was responsible for many power, light and traction installations. Prior to and during World War II Blossom was a member of the important Army Construction Advisory Committee which recommended firms appearing best qualified to undertake particular construction projects for the Army on a cost-plus-fixed-fee basis.

How oscillating wheels can save you untold street maintenance costs...



See the flow of compaction effort that the BROS Self-Propelled roller **with torque converter drive** provides for street seal coating, resurfacing and shallow lift compaction . . .

Here's how it is helping cities throughout the country make great savings in street maintenance costs:

- With full oscillation of all wheel pairs to provide uniform compaction, the BROS SP-54 helps "key" and "lock" aggregate materials tightly in the base course to prevent various pavement failures.
- Wheel oscillation of this roller also kneads the asphalt into a tight, solid surface, eliminating hairline cracks that would otherwise turn into surface breaks. Very important, too, rubber tire rolling correctly imbeds the wearing course chips *without* crushing them.
- Besides such proven advantages, the BROS SP-54 offers these time-saving performance features: a torque converter drive provides smooth, easy handling and eliminates "tipping" of chips when starting; it also lessens drive line strain.
- Full-reversing type transmission with shuttle gear permits rolling in either direction without shifting; turn arounds are thus eliminated.
- Infinite speed range from 0 to 18 mph; positive chain drive to both rear wheel pairs; 50 HP engine and smooth, hydraulic steering provide fast, proper compaction results that you can't get from any other roller. See a BROS Distributor or write us for full information and/or a demonstration. WM. BROS BOILER & MFG. CO., ROAD MACHINERY DIVISION; 1057 TENTH AVE. S. E., MINNEAPOLIS 14.

Find out, too, about the complete BROS TEAM. With the SP-54, the BROS Preparator and Rota-Mixer make the perfect combination for low cost street construction. The Preparator (in-place materials reducer) reduces native over-size materials and old blacktop to proper roadbed sizes. The Rota-Mixer stabilizes and blends the base and wearing course materials to improve load bearing values.

Self-Propelled Roller Rota-Mixer Preparator

BROS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **R. I., Providence**—BA 4/23—City, Central Purch. Depot, City Hall, sewage treatment plant, alterations, repairs, Field's Point Plant. $3,500,000. Plans deposit $100, refundable. Metcalf & Eddy, Statler Bldg., Boston, Mass., engrs. CD 10/19.

BUILDINGS—SLC

▲ **R. I., Natick**—SCHOOL—St. Joseph's School, Natick, soon lets contract L shaped, 216x114 ft., brick school. $3,000,000. Joseph M. Mosher & Son, Inc., 77 Washington St., Providence, archt. CD 1/13/50.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston;
Charles Capone Constr. Co., Inc., 32 Wellesmere Rd., Roslindale, Mass.—CA $2,827,738, est. $2,955,063. sect. 4, hy. work southeast Expressway, Braintree. Bids Feb. 14, awarded Mar. 6. CD 2/16, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **New York**—BA 4/11—The Power Authority of the State of New York, 270 Broadway, New York, Zone 7, channel improvs., Point Three Points, Leishman's Point and Ogden Island near Waddington, St. Lawrence County, Spec. No. PA-5-11008, St. Lawrence Contr. No. 77. Plans deposit $10, Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass., engrs. CD 8/18/54.

▲† **N. Y., Syracuse**—ADDNL. FACILITIES—BA On Or About 4/17—U. S. Eng., 111 E. 16 St., New York, Zone 3, addnl. facilities Syracuse A.F.S., ENG-30-075-56-145, $1,500,000-$2,000,000. Plans deposit $100.

HEAVY CONSTRUCTION—LB & CA

▲ **Charles F. Smith & Sons, Inc.**, Kennett Square, Pa.—LB $1,077,760. constr. water facilities for Alcoa and Massena, near Massena, St. Lawrence County, Spec. PA-5-11005, St. Lawrence Contr. No. 20, NEW YORK Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. Bids Mar. 16. CD 2/13.

▲ **Ralph Tomasetti & Co.**, 1163 58 St., Brooklyn 19, N. Y. CA $1,863,587. (6 bidders) combined replacement relief sewer in Autumn Ave. from Pitkin to Sutter Aves., incl. new siphon chamber; combined sewer in Autumn Ave. from Sutter to Fairfield Aves.; grading Autumn Ave. from Fairfield to Wortman Ave.; from Stanley to Loring Aves., and from Linden Blvd. to Blake Ave.; and regrading Autumn Ave. from Wortman to Stanley Aves., BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn, N. Y. CD 2/10, under LB.

▲ **Herbert F. Darling**, Williamsville, N. Y. CA $1,753,415. Oswego Water Supply Proj., OSWEGO, N. Y. City, Oswego, N. Y. CD 2/24, under LB.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton;
Peter W. Kero, Inc., 216 Washington Ave., Carlstadt, N. J., CA, $825,293, bridge approaches and ramps, Franklin Turnpike intersection with Route 17 U-102 (9) Ramsey, Bergen Co. Bids Feb. 14. CD 2/17, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton;
F. A. Canuso & Sons, Inc., 173 W. Roosevelt Blvd., Phila., Pa., CA, $1,489,717. 2.07 mi. Federal St. from Cooper River to 41 St., F.A.S.P.S.-80 (3), Camden Co. Bids Feb. 21. CD 2/27, under LB.

BUILDINGS—LB & CA

▲ **Cauldwell-Wingate Co.**, 101 Park Ave., New York 17, N. Y. CA $8,663,000. (9 bidders) general constr., DISTURBED PATIENTS' BUILDING Nos. 21 and 21, Kings Park State Hospital, KINGS PARK, N. Y. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. Grand total $10,798,366. CD 2/23, under LB;
Raisler Corp., 129 Amsterdam Ave., New York 23, N. Y. CA $718,780. (2 bidders) heating work (Kings Park, N. Y.);
C. K. Rehner, Inc., 49-20 Skillman Ave., Woodside, N. Y. CA $673,186. (4 bidders) plumbing work (Kings Park, N. Y.);
Arc Electrical Constr. Co., Inc., 739 Second Ave., New York 16, N. Y. CA $744,400. (8 bidders) electrical work (Kings Park, N. Y.).

▲ **Irish Constr. Co.**, 1013 S. State St., Syracuse, N. Y. CA $1,243,555. JUNIOR HIGH SCHOOL; ELEMENTARY SCHOOL, LIVERPOOL, N. Y. Central School Dist. No. 1, Liverpool, N. Y. CD 3/16, under LB.

▲† **Gramercy Constr. Corp.**, 114 Liberty St., New York 6, N. Y. CA $1,236,882. altering BLDG. at U. S. Appraisers' Stores, 201 Varick St., NEW YORK, N. Y. General Services Admin., P. Bldgs. Service, in Bid Room of Business Service Center, 250 Hudson St., New York 13, N. Y. Bids Feb. 15, awarded Mar. 2. CD 2/20, under LB.

▲ **John W. Cowper**, Sideway Bldg., Buffalo, N. Y. CA $1,937,000. (4 bidders) Herbert Hoover Junior High SCHOOL, Kenmore, TONAWANDA, N. Y. Union Free School Dist., Town of Tonawanda, N. Y. CD 3/15, under LB.

▲ **Joseph J. Muscarelle, Inc.**, 42 First St., Hackensack, N. J. LB $1,658,400. general contract; HIGH SCHOOL, TENAFLY, N. J. Bd. Educ., 24 County Rd., Tenafly, N. J. CD 11/8/54.

▲ **Foundation Co.**, 57 William St., New York 5, N. Y. CA Total est. $17,500,000. POWER PLANT BLDG. to house 4th Generating Unit, New Castle Power Plant, NEW CASTLE, PA. Pennsylvania Power Co., 19 E. Washington St., New Castle, Pa.

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York 17, N. Y. CA Total est. $12,000,000. six 2 to 5 story HOSPITAL BLDGS.; POWER PLANT, Greenspring and Belvedere Aves., BALTIMORE, MD. Associated Jewish Charities, Eutaw and Monument Sts., Baltimore 1, Md. CD 2/28, under LB.

SOUTH

BUILDINGS—BA

Ky., **Frankfort**—HOSPITAL—BA 4/12—Frankfort Municipal Hospital Bd. of Trustees, Frankfort, 3 story, bsmnt., brick King's Daughters Hospital addns., alterations. $824,000. Oberwarth & Livingston, 321 Shelby St., Frankfort, archts. Stagg & Fisher, 170 Walnut St., Lexington, engrs. CD 1/12.

HEAVY CONSTRUCTION—LB & CA

▲† **Southern Constr. Co., Inc.**, Daniel Field, Augusta, Ga., CA $2,146,370, FY-56 Military Housing, Marine Corps Auxiliary Landing Field, NOY 91081, BEAUFORT, S. C. Dist. P. Wks. Office, Sixth Naval Dist., Bldg. 12, U. S. Naval Base, Charleston, S. C. Bids Feb. 28. CD 2/8.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

▲ **FLORIDA**—State Road Dpt., Tallahassee;
Dunn Constr. Co., 2508 3 Ave. North, Birmingham, Ala., CA, $1,289,332, grading, roadway, rock base with b. conc. binder course, widn. 88 ft. bridge over Whitaker Bayou, storm sewers 4.932 mi. SR 5, F-011-2 (29) and U-011-2 (31), Jobs 1301-201, 1702-204 and 1702-205, Manatee and Sarasota Counties. Bids Dec. 6, awarded Mar. 9. CD 12/9, under LB.

FLORIDA—State Road Dpt., Tallahassee;
Union Bldg. & Constr. Corp. and Central Florida Constr. Co., Box 425, Riviera Beach, Fla., LB $996,923 (6 bidders), limerock base with b. conc., and binder course, 2 concrete deck slab bridges, 6.23 mi. SR 5, F-003-3 (23), Job 9304-203, Palm Beach Co. Bids Mar. 6. CD 2/21.

BUILDINGS—LB & CA

▲ **Eugene Simpson & Bro.**, 300 Montgomery Ave., Alexandria, Va. CA $2,247,000. constr. Dennis J. O'Connell HIGH SCHOOL, N. 26 and Underwood Sts., ARLINGTON, VA. R. C. Diocese of Richmond, 807 Cathedral Ave., Richmond, Va. Bids Mar. 1. CD 3/14, under LB.

Ed L. Powers Contg. Co., Box 338, Jesup, Ga., LB $752,600. R. L. Cousins Public School for Negroes; Lithia Springs Elementary School addn., Douglas County High School addn. and Winston Elementary School addn., DOUGLASVILLE, GA. State School Bldg. Auth., 41 Exchange Pl. S. E. Atlanta, Ga. Bids Mar. 6. CD 2/3.

▲ **Joe Baker Co.**, 4461 Montevallo Rd., Birmingham 9, Ala., Own Forces, $2,000,000, 120 HOMES in Mountain Dale Subdivision, on Montevallo Rd. BIRMINGHAM, ALA.

G. E. Bass & Co., 2715 N. State St., Jackson, Miss. CA Est. $750,000. 2 story, bsmnt., 182x252 ft., steel, masonry retail STORE, W. College Ave. and St. Landry St., LAFAYETTE, LA. Sears Roebuck & Co., 2101 N. Sta. Paul St., Dallas, Tex. Bids Feb. 23. CD 2/15.

MIDDLE WEST

BUILDINGS—BA

▲ **O., Reading**—POWER PLANT—BA 4/12—City, 2 story, brick concrete bsmnt. electric power plant, 6,000 kw turb. generator, Walnut St. $1,500,000. Plans deposit $20. Willard C. Pistler, 4 W. 7th St., Cincinnati, engr. CD 3/11/55.

Mich., Berkley—SCHOOL—BA 4/23—Bd. Educ., 2325 Catalpa St., Junior High School No. 2, $900,000. Earl G. Myers, 806 Farwell Bldg., Detroit, archt. CD 1/19/55.

▲ **Ill., Springfield**—HOSPITAL—BA 5/22—Memorial Hospital of Springfield, Inc., 1 and Miller Sts., Memorial Hospital addnl. construction, $1,500,000. CD 3/2/55.

HEAVY CONSTRUCTION—LB & CA

▲ **Ferro Concrete Constr. Co.**, 203 W. 3 St., Cincinnati, O., LB $3,483,480, (4 bidders) Contr. 6, Millcreek Sewage Plant, CINCINNATI, O. City, City Hall, Cincinnati, O. Bids Mar. 13. CD 2/24.

▲ **Overland Constr. Co.**, 205 W. Wacker Dr., Chicago 6, Ill., LB $2,551,597, bridge over Calumnet River, 95 St., CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 11/6/53.

BUILDINGS—LB & CA

▲ **Albert M. Higley Co.**, 2036 E. 22 St., Cleveland, O. CA Approx. $4,000,000. DISTRIBUTION CENTER, Aurora Rd., Colon, CLEVELAND, O. Western Electric Co., Inc., 195 Broadway, New York, N. Y. CD 9/29.

▲ **Cleveland Constr. Co.**, 3866 Carnegie Ave., Cleveland, O., CA $1,250,000, 65,000 sq. ft. PLANT OFFICE, Euclid Ave., EUCLID, O. Reliance Electric & Engineering Co., 1088 Ivanhoe Ave., Cleveland 10, O. Arthur E. Rowe & Assocs., 3125 Prospect Ave., Cleveland 15, O., archts.

▲ **Engoglia & Cipiti Builders**, 3368 E. 113 St., Cleveland 4, O. Own Forces. $2,250,000, 120 HOMES, 38½ acre site, McKenzie Rd., NORTH OLMSTED, O.

▲ **Bayridge Builders, Inc.**, 302 E. 309 St., Willoughby, O. Own Forces. $1,300,000. 70 HOMES, Royalview, Densmore, Bayridge and E. 309 Sts., WILLOWICK, O. Howell F. Davis, 29120 Cresthaven Dr., Wickliffe, O., engr.

▲ **Spence Brothers**, 417 McCoskry St., Saginaw, Mich. CA—general constr., Undergraduate LIBRARY, ANN ARBOR, MICH. Total est. $3,680,000. The Regents of University of Michigan, W. K. Pierpont, vice pres., Plant Service Bldg., North University Ave. and Forest Ave., Ann Arbor, Mich.;
Dunbar-Borton, Inc., Adrian, Mich. CA plumbing and heating work (Ann Arbor, Mich.);
Shaw Electric Co., 33200 Schoolcraft St., Livonia, Mich. CA electrical work (Ann Arbor, Mich.);
Otis Elevator Co., 950 W. Fort St., Detroit, Mich. CA elevators (Ann Arbor, Mich.).

▲ **Spence Brothers**, 417 McCoskry St., Saginaw, Mich. CA $2,992,000. general constr., Flint MUNICIPAL

(Continued on page 64)

WHY ENGINEERS FEEL AT HOME AT ROCKETDYNE

First and foremost, ROCKETDYNE talks your language—and understands it too. Your associates and supervisors here are professional people like you. They respect your status, your thinking, your ideas and your interest in technical advancement.

ROCKETDYNE will encourage you to choose the field that is most satisfying and rewarding... truly best for you. This is possible because its activity includes the full range of rocket engine development from preliminary design to field testing and production... because its programs include development of the largest liquid-propellant rocket engine in the Western World... because it has contracts with all branches of the Armed Services and the guided missile industry for broad variety of rocket engine types and sizes.

It may surprise you to know you can qualify for a career at ROCKETDYNE *with or without specific rocket engine experience!* Engineering experience in heating and ventilating, hydraulics, pumps, turbines, combustion devices, controls, dynamics, structures and instrumentation are just a few of the related fields that could open your future at ROCKETDYNE.

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ROCKETDYNE is North American's rocket engine division. It has just moved into new ultra-modern headquarters in Canoga Park, located in the beautiful West San Fernando Valley of Los Angeles. This area is famous for its fine residential sections, modern shopping-center convenience, varied recreational and entertainment facilities. Any point in the San Fernando Valley is just minutes drive from the beaches, and the weather is pleasant all year around. Many engineers are interested in advanced courses offered by fine schools like UCLA, USC and Cal Tech, all within a short drive from our headquarters.

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Mechanical, Chemical, Electrical, Aeronautical, Standards, Structural and Stress. For rocket engine components and systems design or development. Turbine, pump, controls and combustion device experience preferred.

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Experienced on engine systems, combustion devices, turbines, pumps and engine instrumentation.

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ROCKETDYNE

A DIVISION OF NORTH AMERICAN AVIATION, INC.

BUILDERS OF POWER FOR OUTER SPACE

(Continued from page 62)

CENTER, FLINT, MICH. City, Harry K. Cull, city clk., Flint, Mich. CD 3/5, under LB.

Clifford A. Ross Co., 1338 N. Woodward St., Royal Oak, Mich. CA Est. $700,000. Betsy Ross Subdivision, 32 brick HOMES, Yarba Linda Dr. north of 13 Mile Rd., ROYAL OAK, MICH. Wolcott Real Estate (agent), 708 N. Woodward St., Royal Oak, Mich.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ Mo., St. Louis County—PLANT—BA 4/10—Thompson Products, Inc., 23555 Euclid Ave., Cleveland 17, O. for subsidiary Ramsey Corp., 3693 Forest Park Blvd., St. Louis 8, Mo. first unit, 1 story piston ring mfg. plant with 2 story office section on 56 acre site on Manchester Rd. near Weidman Rd. $1,000,000. Extended date. Heilmuth, Obata, Kassabaum, 825 Locust St., St. Louis, Zone 1, archts. CD 3/8.

HEAVY CONSTRUCTION—LB & CA

▲ Fisher Constr. Co., Box 6525, Houston, Tex. CA $3,016,400. multi-story OFFICE, to be known as "Adams Oil Center", HOUSTON, TEX. Ada Oil Co., c/o K. S. Adams Jr., 509 Hughes St., Houston, Tex. CD 3/6, under LB.

▲ Manhattan Constr. Co. of Texas, 1811 Crawford St., Houston, Tex. CA $3,647,000, 13 story, bsmnt., PROFESSIONAL BLDG., 500-AUTO PARKING GARAGE, HOUSTON, TEX. Memorial Hospital, 602 Lamar St., Houston, Tex. Bids Feb. 21. CD 3/6, under LB.

C. D. Lauch Constr. Co., 5404 Cedar St., Boise, Idaho. CA $843,990. general constr. K-shaped RESIDENCE for married students at Montana State University, MISSOULA, MONT. State Bd. Educ., Helena, Mont. Awarded Mar. 12. CD 2/27, under LB.

▲ Stearns & Rogers, 660 Bannock St., Denver, Colo. CA $4,500,000. design and construct, 22,000 kilowatt steam-electric PLANT, Cameo, GRAND JUNCTION, COLO. Public Service Co., Gas & Electric Bldg., Denver, Colo.

▲ Fanderlik-Locke & Myers Brothers, 2566 Mission St., San Marino, Calif. LB $2,354,000. construct and finance 187-unit family HOUSING, CLOVIS AIR FORCE BASE, CLOVIS, N. M. Purch. & Contg. Div., Clovis Air Force Base, Clovis, N. M. CD 1/20.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† Oregon—BA 5/1—U. S. Eng., 628 Pittock Block, Portland, Hills Creek Reservoir, incl. diversion tunnel and detour road, incl. timber bridge, on Middle Fork of Willamette River, Lane Co. Total est. $33,600,000. CD 11/18.

HEAVY CONSTRUCTION—LB & CA

▲† Marshall & Haas, Yuma, Ariz. CA, $1,164,494. earthwork, concrete lining, structures, for Ralph's Mill Area, Mohawk Laterals Gila Proj., Wellton-Mohawk Div., Spec. DC 4536, ARIZONA. Bureau Reclamation, Dpt. Interior, Yuma, Ariz. Bids Feb. 14. CD 2/21, under LB.

BUILDINGS—LB & CA

▲ Gilbert & Dolan Contractors, 2939 N. Central Ave., Phoenix, Ariz. CA, $1,000,000. MOTOR HOTEL, with swimming pool "Safari Motor Hotel" SCOTTSDALE, ARIZ. Earnest A. Uhlmann & W. P. Ritter c/o Alfred N. Beadle, archt., 7030 N. 12 St., Phoenix, Ariz.

▲ R. J. Daum Constr. Co., 12537 S. Cerise Ave., Hawthorne, Calif. CA, $1,950,000. branch JUVENILE HALL FACILITY, LOS ANGELES, CALIF. Los Angeles Co., Hall of Records, Los Angeles, Calif. Bids Mar. 7. CD 3/12, under LB.

CANADA

HEAVY CONSTRUCTION—BA

▲ Ont., Cornwall—BA 4/16—City, City Hall, water purification plant, $1,000,000. Plans deposit $100. Gore & Storrie Ltd., 1130 Bay St., Toronto, engrs. CD 4/13/51.

BUILDINGS—BA

▲ Ont., Toronto—ADMINISTRATION—BA 4/11—Toronto Transit Comn., 35 Yonge St., 6 story (ultimately 9 story) 92x163 ft., rein.-con., structural steel, administration bldg. $2,000,000. Plans deposit $100. Charles B. Dolphin, 880 Bay St., archt. CD 12/15.

HEAVY CONSTRUCTION—LB & CA

▲ Raymond Concrete Pile Co., 77 York St., Toronto, Ont., CA, $1,250,000, dock facilities expansion, HAMILTON, ONT. International Harvester Co. of Canada Ltd., 700 Hillyard Ave., Hamilton, Ont. Awarded Mar. 7. CD 1/4.

Standard Paving & Materials Ltd., 1706A Avenue Rd., Toronto, Ont., LB $697,802, (3 bidders) concrete bridge at Bathurst St. over west branch of Don River, plus road widening, grading, graveling nearby, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Mar. 12. CD 3/6.

▲ Rayner Constr. Ltd., 29 Commercial Rd., Toronto, Ont., CA, $1,479,431, four 100 ft. digester tanks and control bldgs., gas control sys., incl. 60 ft. diam. gas holder, gas control bldg., appurtenances, Ashbridge's Bay Sewage Treatment Plant, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Jan. 30, awarded Mar. 12. CD 2/6, under LB.

▲ Marine Industries Ltd., 1405 Peel St., Montreal, Que., CA, $10,636,000, (2 bidders) dredging in Lachine Section of St. Lawrence Seaway, QUEBEC. St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont. Bids Mar. 6. CD 2/27.

BUILDINGS—LB & CA

Dominion Constr. Co. Ltd., 838 11 Ave. W., Calgary, Alta., CA, $800,000, 1 story, bsmnt., 145,000 sq. ft., steel, masonry PLANT, with 2 story OFFICE section, CALGARY, ALTA. Marshall Wells Ltd., Market and Rorier Sts., Winnipeg, Man.

▲ M. Sullivan & Sons Ltd., 234 Elgin St., Arnprior, Ont., CA, $2,351,425, 125-bed, 4 story, 50x281 ft. and 60x136 ft. T-shaped, rein.-con. MILITARY HOSPITAL, KINGSTON, ONT. Defence Construction (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Feb. 21, awarded Mar. 9. CD 1/23.

▲ Ellis-Don Constr. Co., Box 852, London, Ont., CA $1,303,000. 4 story, X-shaped with main body 45x160 ft., wings 45x80 ft., 45x132 ft. HOSPITAL UNIT, OWEN SOUND, ONT. Owen Sound General & Marine Hospital, Owen Sound, Ont. Bids Feb. 27, awarded Mar. 14. CD 2/1.

James More & Sons Ltd., 239 Argyle Ave., Ottawa, Ont., CA, $724,000, 162-bed HOME FOR AGED, RENFREW, ONT. Renfrew Co., Court House, Pembroke, Ont. Bids Nov. 17. CD 11/9.

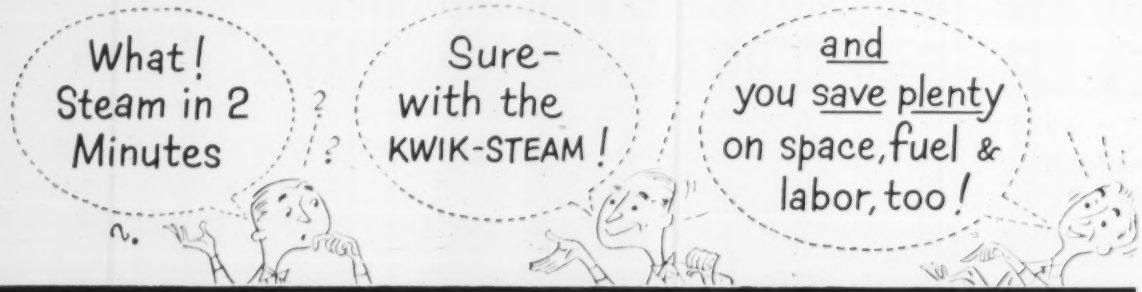
ALASKA

HEAVY CONSTRUCTION—BA

▲† Alaska—PARKING APRON—BA 4/12—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., repairing, resurf. aircraft parking aprons to serve Hangars 2, 3 and 4 Ladd Air Force Base, Inv. 56-35. $1,000,000. Extended date. CD 2/23.

BUILDINGS—LB & CA

▲† S. S. Mullen Inc., 621 Ninth Ave. N., Seattle, Wash. CA $3,477,306. BARRACKS, MESSHALL BLDG., RADIO RECEIVER BLDG., GARAGE and RIGGERS SHOP, EMERGENCY POWER and HEATING PLANT, terminal equip. bldg., rein.-con. water supply system, etc at Naval Station, Spec. 37594, KODIAK, ALASKA. Pub. Wks. Officer, 17th Naval Dist., 908 7th Ave., Seattle, Wash. CD 3/6, under LB.



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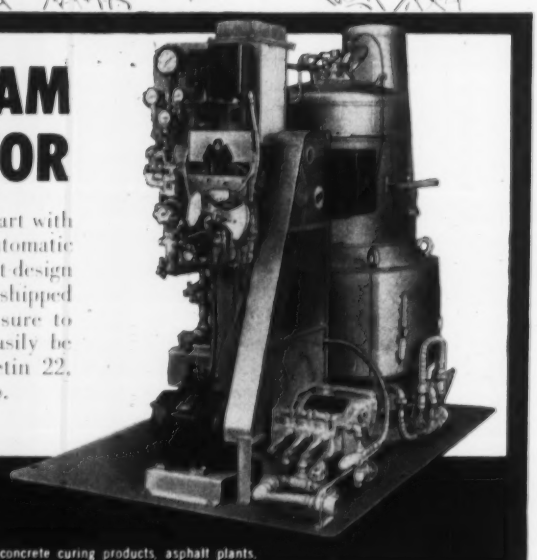

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LATIN AMERICA

HEAVY CONSTRUCTION—BA

Colombia—BA, 4/30—Corporacion Autonoma Regional del Cauca, Edificio Zaccour, 934, Cali, constr. Calima Hydroelectric Proj. near Cali; incl. dam approx. 95 meters maximum height, and 250 meters long, 120,000 kw. underground power house with 140 meters deep vertical access shaft, penstock shafts and tailrace tunnel with combined length approx. 2,300 meters, tributary diversion tunnel 7 to 8 kilometers long, etc. Gibbs & Hill, Inc., Pennsylvania Station, New York, N. Y., consult. engr., adv. ENR 3/29/56. CD 1/21/54.

PROPOSED PROJECTS

WATER SUPPLY

▲ Tex., Fort Worth—City, Dr. Jack Garrison, mayor, City Hall, 30 in. Edgewood tank water mains $70,000, North Side sewage collection mains $1,000,000, 2 m.g.d. elevated storage tank in Edgewood Addn. $235,000, 36 in. water mains, Beach St. $145,600, Carter & Burgess, 8154a Throckmorton St., consult. engrs.; 24 in. water main, Parkhill Addn. $138,000, 24 in. Timberline Rd. water mains from Mitchell Blvd. to Village Creek Dam $66,000, East Side pump station $130,000, Russom Ranch pump station $105,000, 2 m.g.d. elevated water tank on Timberline Dr. $200,000, 24 in. water line, Timberline Dr. $210,000, Joe J. Rady, 511 Insurance Bldg., consult. engr.; 42- to 48-in. Como water main from South Holly Plant to southwest loop $1,350,000, Como pump station and 6 m.g.d. ground storage tank $280,000, Edwards Ranch pump station $120,000, ground storage tank on Russom Ranch $500,000, South Holly water plant $2,500,000, Freese & Nichols, 407 Dancigers Bldg., consult. engrs.; 7½ m.g.d. ground storage tank, pumping station on Stage Coach Rd. $265,000, 1,000 ft. plane water mains to Russom Ranch station $650,000; 36 in. water mains Wellesley Rd. from Williams Rd. to Wellesley $375,000. Westland addn. elevated storage tank $250,000, Reaves & Gregory, 3332 W. 7th St., consult. engrs. CD 2/8.

SEWERS, WASTE DISPOSAL

▲ Ky., Louisville—Metropolitan Sewer Dist., 412 W. Market St., relief sewers, $22,638,000; interceptor sewers, $10,200,000; proposed relief sewers to residential areas, $6,078,000; sludge drying equip., $770,000. Morris Forman, c/o owner, engr. CD 7/12/54.

BRIDGES

▲ Conn., Hartford—Hartford Bridge Auth., 284 Sheldon St., 5 bridges over Connecticut River, Weathersfield, South Windsor, Hartford, East Hartford, and Windsor $45,000,000. Coverdale & Colpitts, consult. engrs., 120 Wall St., New York, N. Y., making preliminary survey. Edwin B. Burdick, c/o owner, engr. CD 2/2.

▲ KENTUCKY and OHIO—Kentucky State Hy. Dpt., Frankfort, Ky., and Ohio State Hy. Dpt., Columbus, O., Hamilton Co.—approaches to proposed bridge across Ohio River west of present C. & O. bridge, for four-lane bridge, $18,900,000; for six-lane bridge, $21,600,000. Kenton Co.—4-lane bridge across Ohio River at Cincinnati-Covington, $6,000,000. 6-lane bridge, same location, west of C. & O. present bridge, $10,000,000. Hazelet & Erdal, Dixie Terminal Bldg., Cincinnati, O., consult. engrs. CD 2/23/55, under Kentucky.

STREETS AND ROADS

▲ Calif., Pasadena—City, City Hall, voted $6,692,000 bonds, streets imprvs. CD 2/10.

▲ CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford.
Hartford Co.—imprv., widen. New Britain Ave. 1½ mi. b. conc., drainage facilities, railroad undergass imprv., Elmwood, $500,000.
Litchfield Co.—widen., reconstr. Main St., replacing Case Ave., Bridge St. Bridges, 4-lane divided hy. Winsted, $3,000,000.

▲ O., Toledo—City, City Hall 2-mill 20-year real estate tax levy to be voted on May 8, highway imprvs. $21,940,000. CD 11/25/53.

EARTHWORK, WATERWAYS

▲ Calif., San Francisco—City and San Francisco Co., City Hall, Don Pedro dam and reservoir, on Tuolumne River part of Cherry Valley Flood Control Project, Stanislaus Co. $75,000,000.

LATIN AMERICA

▲ Mexico, Monclova—FERTILIZERS FACTORY—Altos Hornos de Mexico, Monclova, plans fertilizers factory, $10,000,000.

PUBLIC BUILDINGS

▲ Calif., Fairfield—SCHOOL—Armijo Union High School Dist., Box 483, voted bonds, school, $2,550,000. Schmidts, Hardman & Wang, 1320 University Ave., Berkeley, archts. CD 12/30.

▲ Calif., Lafayette—SCHOOLS—Lafayette Elementary School Dist., P.O. Box 817, voted $970,000 bonds Mar. 6, schools addns. $2,970,000. CD 12/21.

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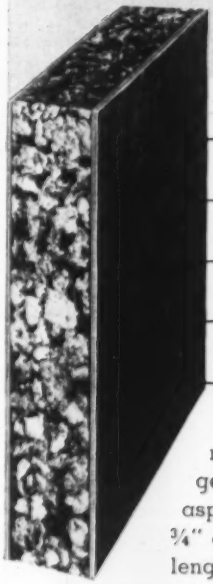

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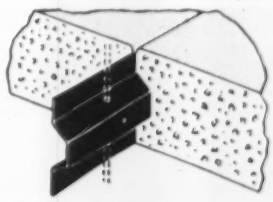

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▲† Calif., Oakland — HOSPITAL — Veterans Admin., Munitions Bldg., Wash., D. C., 500-bed hospital on new site, $11,500,000, incl. technical service and equip.

▲ Calif., Salinas—CIVIC CENTER—City, City Hall, plans by Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, civic center, incl. public safety bldg., library, auditorium and city hall, $2,000,000. Wm. J. Moran Co., Oakmont Ave., Oakland, consult. engr.

▲ Calif., Santa Clara—HOSPITAL WING—Santa Clara Co., Court House, plans by Stone, Mulloy, Marraccini & Patterson, 619 California St., San Francisco, nursing wing, Santa Clara County Hospital, $4,300,000.

▲ Calif., Santa Rosa — SCHOOLS — Santa Rosa City School Dist., P.O. Box 404, voted bonds, elementary and high school facilities, $3,925,000. CD 2/27.

▲ Calif., Stockton—COURT HOUSE—San Joaquin Co., Court House, plans by Mayo, Johnson & deWolf, 307 Exchange Bldg., and Clowdsley & Whipple, 207 Exchange Bldg., bond election in November, county court house, $6,000,000. CD 11/7/52.

▲ Colo., Greeley—DORMITORIES, etc.—Colorado State College of Educ., Greeley, plans by Swanson-Rinne & Assocs., 1707 Gilpin St., Denver, and Murray Riley & Assoc., 810 23 St., Denver, two 3 story dormitories and dining hall addn., $2,750,000. Robert Linstedt, 625 W. 14 St., consult. engr. CD 1/9.

▲ Conn., New Haven—REGIONAL MARKET—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Caproni Assoc., 1221 Chapel St., constr. New Haven Regional Market, New Haven Harbor, $2,000,000. F. M. Stibbs, c/o owner; engr. Leo F. Caproni, 1221 Chapel St., consult. engr. CD 2/8/55.

▲ Conn., Windsor—SCHOOLS—Town, Bd. Educ., Windsor, Center District Junior High School, Park Ave. Elementary School, and Wilson Elementary School, $3,500,000. CD 1/11.

▲ Ill., Berwyn—SCHOOL—Bd. Educ., plans by Kralovec & Best, 223 W. Jackson St., Chicago, Zone 6, 2 story high school, boiler house, 22 St., Riverside Dr., 26 St. $4,600,000.

▲† Ill., Downey — HOSPITAL, etc. — Veterans Admin., Munitions Bldg., Wash., D. C., 1st phase, replacing hospital, $24,100,000; 2nd phase, modernization existing buildings, $10,000,000.

▲ La., New Orleans—LIBRARY—City, City Hall, plans by Curtis & Davis, Favrot & Reed, Mathes & Bergman, 338 Baronne St., 2 story, aluminum, glass, concrete library, Loyola and Tulane Aves., $2,200,000. CD 12/16.

▲† Mass., Bedford—MEDICAL REHABILITATION, etc.—Veterans Admin., Munitions Bldg., Wash., D. C., modernization program, Phase I, physical medical rehabilitation bldg., chapel, canteen and theater, alterations to Recreation Bldg. No. 10, $2,141,900. CD 10/25/46.

▲ Mich., Waterford — SCHOOL — Waterford Twp., Bd. Educ., constr. Junior High School, $2,000,000.

▲† Miss., Jackson — HOSPITAL — Veterans Admin., Munitions Bldg., Wash., D. C., hospital, replacing existing one, $13,600,000, incl equip.

▲ Mo., Webster Groves (St. Louis 19 P. O.)—SCHOOL—School Dist. of Webster Groves, Bd. Educ., Leonard A. Steyer, supt. Schools, 16 Selma Ave., Zone 19, $2,850,000 bond election Apr. 3, Junior High School, elementary school, addns., impvs. CD 12/11/53.

▲ N. Y., Camillus—SCHOOL—Central Dist. 1, towns of Camillus, Onondaga, Van Buren, Geddes and Elbridge, a referendum vote Apr. 17 on a bond issue to finance constr. of two elementary schools, $2,000,000.

▲ N. Y., Cheektowaga—SCHOOL—Maryvale School Bd., Samuel R. Bennett, principal, 1050 Maryvale Dr., voted $2,345,000 bonds Feb. 7, Junior High School. Foit & Baschnagel, 232 Delaware Ave., Buffalo, archts. CD 1/16.

▲† O., Dayton—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., modernization program, Phase II, alterations, addns., GMS Building D, Brown Hospital, $2,789,200.

▲ O., Lorain—HIGH SCHOOL—Bd. Educ., Lorain, high school, Oberlin Ave. near stadium, $4,500,000.

▲ O., Toledo—MUNICIPAL—City, City Hall, 2-mill, 20-year real estate tax levy to be voted on May 8, municipal bldg., $2,060,000. CD 9/3/52.

▲ Pa., New Castle—SCHOOL—School Dist. of Neshannock Twp., brick, block Junior-Senior High School, $2,000,000.

▲ R. I., Providence—SCHOOL—City, School Dpt., 20 Summer St., plans by Harkness & Geddes, 726 Industrial Trust Bldg., elementary school, Willard Ave. Sect., $2,000,000. CD 10/19.

▲† Tenn., Memphis—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., 1,000 bed hospital, $23,000,000. CD 1/19/49.

▲† Tenn., Murfreesboro—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., modernization program, Phase I, therapeutic exercise clinic and special services bldg., $2,261,400.

▲† Tenn., Nashville—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., hospital, vicinity of Vanderbilt University, $11,500,000.

▲† Tex., Temple—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., 500-bed hospital and modernization 350 bed domiciliary, $12,000,000.

▲ Tex., Waco—HOUSING—Waco Housing Auth., Box 978, plans by Wm. M. McPherson, 114 Princess Pass, San Antonio, 400-housing units, $4,000,000. R. Marvin Shipman, 146 W. Olmos St., San Antonio, consult. engr. CD 7/31/50.

▲† Va., Kecoughtan—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., modernization program, Phase II, new administration wing, Bldg. 210 and new intermediate hospital, $3,391,300.

▲ Wis., Milwaukee—SCHOOL—Bd. School Directors, 1111 N. 10 St., Zone 3, plans by M. W. Meyer & Assocs., 424 E. Wells St., constr. West Division High School, $3,000,000. Robert J. Strass, 225 E. Michigan st., structural engr. CD 6/15.

▲† Wis., Wood—HOSPITAL—Veterans Admin., Munitions Bldg., Wash., D. C., first phase, new 1,250 bed GM hospital, $26,000,000; second phase converting existing hospital into domiciliary $8,800,000.

COMMERCIAL BUILDINGS

▲ Calif., Los Gatos—HOME SUBDIVISION—Arne Arnesen, 86 Alejandra Dr., Atherton; 79-home subdivision, $2,000,000.

▲ Calif., San Rafael—HOUSING—R. F. Alonquist, San Rafael, and C. C. B. Wheeler, Ignacio, 65-home subdivision, Harbor Estates, $2,795,000.

▲ Calif., Westminster—DWELLINGS—C. Michale, Inc., Box 266, Midway City, 233 frame, stucco dwellings, Tract 2298, $2,500,000.

▲ Colo., Denver—SCHOOL—Wallace School, 4414 Logan St., plans by Victor Hornbein, consult. engr., archt., 714 Pontiac St., school, $5,000,000.

▲ Conn., Trumbull—SHOPPING PARK—Thomas Frouge, 141 North Ave., Bridgeport, shopping park, 60-acre tract, Main St. $6,000,000.

▲ Fla., Deerfield Beach—APARTMENT—Cove Beach Club, c/o Robert E. Hanson, 311 S.E. 16 Ave., Ft. Lauderdale, 90-unit 8-story, 44x270-ft., rein.-con. cooperative apartment, 20 Deerfield Beach, $2,500,000.

▲ Ill., River Forest—COLLEGE EXPANSION—Rosary College, River Forest, plant expansion, $3,000,000.

▲ Mass., Gloucester—SHOPPING CENTER—George C. Kreason Jr., Hesperus Ave., Magnolia, plans by John G. Danielson, 16 Court St., Boston, shopping center, 1 and 2 story bldgs., incl. 19 establishments and fraternal center, New St. off Bass Ave. $2,000,000. Bids in October.

▲ N. J., Eatontown—SHOPPING CENTER—Monmouth Shopping Center, c/o Feist & Feist, realtors, 58 Park Pl., Newark, plans by Kahn & Jacobs, 2 Park Ave., New York, N. Y. shopping center, 75-acre site, Rte. 35, $10,000,000. Abbett Merkt & Co., 10 E. 40 St., New York, N. Y., consult. engrs. CD 2/14.

▲ N. J., Eatontown—SHOPPING CENTER—Samuel Weinstein, c/o Sterling Furniture Shop, 21 White St., Red Bank, plans by Bernard Kellenyi, 17 Linden Pl., Newark, Midcounty Shopping Center, $12,000,000-$15,000,000. Bids in about 2 weeks.

▲ N. Y., Brooklyn—HOUSING—Amalgamated Meat Cutters & Butcher Workman of N. America, 113 W. 42 St., New York, Zone 36, housing, to be called Senior Village, three 14-story apartments, on 4.76-acre tract bounded by Linden Blvd., Bristol St., Rockaway and Hegeman Aves. $5,000,000.

▲ N. C., Laurinburg—COLLEGE—Consolidated Presbyterian College, Laurinburg, 4-year co-educational college, $5,000,000. W. H. Neal, Winston-Salem, chn. Bd. Maturity 1960.

▲ O., Lyndhurst—HOMES—J. & E. Constr. Co., 2199 S. Green Rd., Cleveland, Zone 21, plans by Marvin Rukin, 2195 Green Rd., Cleveland, Zone 21, 126 homes, 33-acre site, $3,150,000.

▲ O., Warrensville Heights—HOMES—J. & E. Constr. Co., 2199 S. Green Rd., Cleveland, Zone 21, plans by Marvin Rukin, 2195 Green Rd., Cleveland, Zone 21, 525 ranch and semi-ranch homes, 150-acre Clarkwood Estates, northeast intersection of Green and Emery Rds. $10,500,000.

▲ O., Willowick—HOMES—J. & E. Constr. Co., 2199 S. Green Rd., Cleveland, Zone 21, plans by Marvin Rukin, 2195 Green Rd., Cleveland, Zone 21, 200 homes, 65-acre Bayridge development, $3,300,000.

▲ Pa., Phila.—NURSES HOME—Jefferson Medical College, 10 and Sansom Sts., nurses home, $2,350,000.

▲ Tex., Victoria—HOUSING—Procurement Office, Foster Air Force Base, Victoria, construct and finance 500 family housing units, Foster Air Force Base, $6,750,000.

▲ Utah, Salt Lake City—HOSPITAL WING—Holy Cross Order of Catholic Sisterhood, Sister Olivia Marie, Admin., 1045 E. 1st St., plans by John Maloney & Assoc., Central Bldg., Seattle, Wash. hospital wing for Holy Cross Hospital, $2,000,000. CD 2/8.

INDUSTRIAL BUILDINGS

▲ Ariz., Kyrene—PLANT—Thunderbird Chemicals Corp., c/o Rex G. Baker, Jr., Commerce Bldg., Houston, Tex. ammonia chemicals plant, $11,000,000. Chasco Services, Inc., 2 Rector St., New York, N. Y., consult. engr. CD 2/9.

▲ California—ATOMIC POWER PLANT—General Electric Co., River Rd., Schenectady, N. Y., and Pacific Gas & Electric Co., 245 Market St., San Francisco, Calif., 5,000 kw. boiling water reactor type atomic power plant, $3,000,000-$4,000,000.

▲ Ky., LaGrange—PLANT—Clayton Lamgert, Middletown, O., plant mfg. steel silos, grain driers, bulk feed bins, furnace and air conditioning ducts on 63 acre site, near here, $2,000,000.

▲ N. J., Bloomfield—RESEARCH CENTER—Colgate-Palmolive Co., 509 Madison Ave., New York 22, N. Y. plans by Eggers & Higgins, archts., 100 E. 42 St., New York, N. Y., and Wheeler & Becker, assoc. archts., Free Press Bldg., Detroit, Mich., 2 story, 200,000 sq. ft. research center, $5,000,000-$8,000,000. CD 10/6.

▲ N. Y., Buffalo—YARD CLASSIFICATION CENTER—New York Central R.R., R. J. Crane, ch. engr., 466 Lexington Ave., New York, electrically controlled yard classification center in East Buffalo, incl. [illegible] 2 story bldg. with tower at hump for controls, 2 story bldg. with tower for retarding equip. and offices, 2 story bldg. at west end will house crew facilities, 24-room YMCA and cafeteria, in East Buffalo, $10,600,000. Constr. in two weeks.

▲ N. Y., Syracuse—PRODUCTION FACILITIES, etc.—Carrier Corp., 300 S. Geddes St., Zone 1, plans by Schmidt, Garden & Erikson, engrs.-archts., 104 S. Michigan St., Chicago, Ill., and Carson & Lundin, consultants, 50 Rockefeller Plaza, New York, Clarke & Rapuano, landscape archts., 145 E. 32 St., New York, production facilities $5,500,000; 2 story administration, personnel and research bldg., $5,000,000; addn. to engineering bldg. $1,500,000, Thompson Rd.

▲ Pa., Eddystone—POWER PLANT—Phila. Electric Co., Ninth and Sansom Sts., Phila., power plant for two 325,000 kw turbine generators, $50,000,000.

▲ Tex., Denver City—PLANT, etc.—Frontier Chemical Div. of Union Chemical & Materials Corp., 140 Stanwix St., Pittsburgh 22, Pa., brick masonry, structural steel chemical plant addn., $3,375,000; warehousing, $100,000.

▲ Tex., Fannett—PLANT—Texas Gulf Sulphur Co., 2nd Natl. Bank Bldg., Houston, sulphur mining plant, $7,500,000. CD 3/9.

▲ Tex., Freeport—PLANTS—Dow Chemical Co., Freeport, acetylene plant unit, $7,500,000; methyl acetylene plant unit, $7,000,000; athanolamines plant unit, $13,000,000; synthetic glycerine and fumigants plant unit, $12,500,000; enlarge some present plant facilities, $5,000,000. CD 3/10/54.

▲ W. Va., South Charleston—PLANT—Food Machinery & Chemical Corp., 1105 Coleman St., San Jose, Calif., modernization program at Westvaco Chlor-Alkali division plant, $2,000,000. H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., engr. CD 10/18.

UNCLASSIFIED

▲ Calif., Ontario—MOTOR RACEWAY—U. S. Automotive Testing Inc., c/o Quinton Engineers Ltd., consult. engrs., 812 W. 8 St., Los Angeles, Los Angeles International Motor Raceway, incl. grandstand, shops, garages, 22,000 car parking, restaurants etc. $12,000,000. Work to start in April.

▲ O., Toledo—ZOO IMPRVS.—City, City Hall, 2-mill, 20-year real estate tax levy to be voted on May 8, zoo imprvs. $2,000,000. CD 3/29/54.

▲ O., Toledo—PARKS, etc.—City, City Hall, 2-mill, 20-year real estate tax levy to be voted on May 8, parks and recreational facilities, $4,000,000. CD 12/5/46.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BUILDINGS—BA

▲ R. I., Providence—SCHOOL—BA 4/16—City, School Dpt., 20 Summer St., Providence, elementary school Willard Ave. Section, South Providence, $2,000,000. Harkness & Geddes, Industrial Trust Bldg., archts. CD 3/15

HEAVY CONSTRUCTION—LB & CA

† The Arundel Corp., Pier 3, foot of Fulton St., Brooklyn, N. Y., CA, $1,117,225, dredging Portsmouth Harbor and Piscataqua River, CIVENG-19-015-56-95, NEW HAMPSHIRE, U. S. Eng., 150 Causeway St., Boston, Mass. Bids Mar. 2. CD 3/7, under LB.

▲ D. C. Loveys Co., 141 Harvey St., Cambridge, Mass. CA $1,024,170, est. $800,000-$400,000. Special AAA facilities, Beverly Airport and Brimball Hill, Beverly, ENG-19-016-56-92, MASSACHUSETTS, U. S. Eng., 150 Causeway St., Boston, Mass. CD 2/16, under LB.

▲ MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
C. J. Maney Co., Inc., 173 Bedford St., Lexington, Mass. CA $2,932,059, est. $3,000,000. IN 349 (2) Contr. No. 5, Northeast Expressway Cutler Hy. interchange to Revere Beach, Revere. CD 2/16, under LB.

BUILDINGS—LB & CA

▲ John Bowen Co., Inc., 173 Boston St., Dorchester, Mass. CA $1,123,350, est. $1,900,000. BUILDING (retail and offices) 480 Boylston St., BOSTON, MASS. George Robert White Fund, City Hall, Boston, Mass. CD 2/27, under LB.

▲ Tocci Bros. Constr. Co., Inc., 38 Colonial Ave., Newtonville, Mass. LB $1,422,721, est. $1,500,000. HIGH SCHOOL, Plymouth St., EAST BRIDGEWATER, MASS. Town, High School Bldg. Comm., c/o Supt. Schools, 4 N. Bedford St., East Bridgewater, Mass. Bid Mar. 13. CD 2/23.

▲ Greenwich Woods Homes, c/o Harry Bennett & Assocs., High Ridge Rd., Stamford, Conn. Owner Builds. $2,400,000. 100 HOUSES, GREENWICH, CONN.

Victor F. Atkins, 103 Sylvan Ave., Waterbury, Conn., LB $659,225, Walsh SCHOOL repairs, alterations, addns., WATERBURY, CONN. Town, Bd. Educ., Crosby High School, Waterbury, Conn. (Correction—contractor). CD 1/11, under CA.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
April 4 Maryland April 12 New York
STREETS AND ROADS
April 3 Maryland, New Jersey April 12 New York

BUILDINGS—BA

▲ Pa., Phila., BOILER HOUSE, etc.—BA 4/11—General State Auth., 18 and Herr Sts., Harrisburg, boiler house laundry, warehouse, Bldgs. No. 1 and 2, Phila. Tuberculosis Sanatorium, $1,600,000. Plans deposit $10. each. Extended date. Engineering Consultants, 843 N. 19 St., Phila., engrs. CD 3/12.

▲ N. J., Lakewood—SCHOOL—BA 4/16—Lakewood Bd. Educ., high school, $1,350,000. Mickelwright & Mountford, Prospect and Stuyvesant Aves., Trenton, archts. CD 2/11/55.

▲ Pa., Upper Darby—SCHOOL—BA 4/16—Upper Darby Twp. School Auth., Lansdowne Ave. and School Lane, Junior High School, $2,500,000. The Ballinger Co., 121 N. Broad St., Phila., engr.-archt. CD 4/14/55.

▲† Md., Middle River—SITE IMPRVS.—BA 4/19—U. S. Eng., P.O. Box 1715, Baltimore, Zone 3, site imprvs., utilities, Glenn L. Martin Airport for Air National Guard. $1,000,000. Plans deposit $25. Whitman, Requardt & Assoc., 1304 St. Paul St., Baltimore, Zone 2, engrs. CD 1/17/56.

HEAVY CONSTRUCTION—LB & CA

▲ Atlas Tile & Marble Co., 41-17 Crescent St., Long Island City, N. Y. CA $1,078,980. (3 bidders) interior finish for third Tube of Lincoln Tunnel, NEW YORK, Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 3/8, under LB.

▲ Charles F. Smith & Sons, Inc., Kennett Square, Pa. CA $1,077,760. constr. water facilities for Alcoa and Massena, near Massena, St. Lawrence County, Spec. PA-5-11005, St. Lawrence Contr. No. 20, NEW YORK Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. CD 3/19, under LB.

▲† B. Perini & Sons, Inc., 73 Montwait Ave., Framingham, Mass., Morrison-Knudsen Co., Inc., 319 Broadway Ave., Boise, Idaho, Peter Kiewit Sons Co., 1024 Omaha National Bank Bldg., Omaha, Neb., Utah Constr. Co., 100 Bush St., San Francisco, Calif., Walsh Constr. Co., 122 E. 42 St., New York, N. Y. CA $26,751,837. (joint venture) constr. Grasse River Lock in St. Lawrence Seaway, NEW YORK, U. S. Eng., Niagara and Bridge Sts., Buffalo 7, N. Y. CD 3/8, under LB.

▲ Avalon Sewerage Auth., Avalon, N. J., rejected bids Jan. 21, sewage treatment plant, pumping stations, sewers mains, etc., AVALON, N. J. Will re-advertise. Est. $1,082,460. CD 2/24, under LB.

▲ Lycoming Constr. Co., 127 Susquehanna St., Williamsport, Pa. CA $4,725,315. constr. Penn Forest Dam and reservoir and appurtenant work in connection with Wild Creek Gravity Water supply system, BETHLEHEM, PA. Bethlehem Auth., 6 W. Broad St., Bethlehem, Pa. Bids Feb. 2, awarded Feb. 9. CD 2/17, under LB.

BUILDINGS—LB & CA

▲ H. R. H. Constr. Corp., 16 W. 46 St., New York 19, N. Y. LB $3,183,000 (7 bidders) general constr.; LB $3,576,000 (9 bidders) foundations and general constr.; LB $435,000 (9 bidders) foundation only, for Summer HOUSES (Proj. No. NYS-58-4 Sect. II) incl. Bldgs. Nos. 8 to 13 (inclusive) located in area bounded generally by Park Ave., Summer Ave., Myrtle Ave. and Troop Ave. in Brooklyn Boro, BROOKLYN, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids Mar. 20. CD 2/23;
Wachtel Plumbing Co., 1345 Cromwell Ave., New York 52, N. Y. LB $493,000 (7 bidders) plumbing work (Brooklyn, N. Y.).

▲ John W. Cowper Co., Sidway Bldg., Buffalo, N. Y. CA Est. $1,000,000. 24 concrete SILOS, 1751 Fuhrman Blvd., BUFFALO, N. Y. Lehigh Portland Cement Co., 1751 Fuhrman Blvd., Buffalo, N. Y. H. E. Plumer & Assoc., 775 Main St., Buffalo, N. Y., engrs. Awarded Mar. 8.

▲ F. D. Rich Co., Inc., 322 Main St., Stamford, Conn. LB $6,638,000. (4 bidders) general constr., MEDICAL-SURGICAL CENTER (Bldg. No. 86) Gowanda State Homeopathic Hospital, HELMUTH, N. Y. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids Mar. 15, CD 1/24;
Quackenbush Co., Inc., 505 Franklin St., Buffalo, N. Y. LB $599,470. (5 bidders) heating work (Helmuth, N. Y.);
Sams Corp., 132 Blackstone Ave., Jamestown, N. Y. LB $684,000. (5 bidders). sanitary work (Helmuth, N. Y.);
Volker Bros., Inc., 891 Washington St., Buffalo, N. Y. LB $479,753. (6 bidders). electrical work (Helmuth, N. Y.).

▲ Southridge Co-operative, Section 3, Inc., c/o Samuel Paul, archt., 89-51 164 St., Jamaica, N. Y. Owner Builds. $3,000,000. 3 APARTMENTS, 360 units, on tract bounded by Northern Blvd., 90 St., 34 Ave. and 91 St., JACKSON HEIGHTS, N. Y.

▲ Imperial Gardens Homes, c/o Long Island Homes, 168-12 Hillside Ave., Jamaica 32, N. Y. Owner Builds. $1,600,000. 100 HOUSES on tract on Carmans Rd., north of Sunrise Hy., MASSAPEQUA, N. Y.

▲ Syndicate, c/o Arthur Weiser, archt., 20 E. 53 St., New York 22, N. Y. Owner Builds. $5,000,000. two 19 story APARTMENTS, 478 units, at site bounded 9 St., Broadway, 10 St. and Fourth Ave., NEW YORK, N. Y.

▲ A. A. Roth, c/o Schulman & Soloway, archts., 100-15 Queens Blvd., Forest Hills, N. Y. Owner Builds. $5,000,000. Regional STORE development to be called Beach Shopping Center, on 30 acre tract on East Main St., PEEKSKILL, N. Y.

▲ Kent Knolls Houses, c/o Stanley H. Klein, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds. $1,000,000. 56 HOUSES on tract at Plainview Rd. and Cynthia Dr., PLAINVIEW, N. Y.

▲ Christensen & Neilson, 422 Liberty St., Schenectady, N. Y. CA $1,278,000. (8 bidders) SCHOOL, ROME, N. Y. Rome Free Academy, Turin St., Rome, N. Y. CD 3/14, under LB.

Hillsdale Manor Homes, c/o Leonard Feinen, archt., 320 Lincoln Ave., Hasbrouck Heights, N. J. Owner Builds. $850,000. 37 HOUSES on tract at Hillsdale Ave., east of Van Emburgh Ave., HILLSDALE, N. J.

B. J. Lucarelli & Co., Inc., 22 Orchard St., Jersey City, N. J., CA, $800,000. DINNEEN HALL, incl. 3 story, brick bldg., Hudson Blvd. and Montgomery St., JERSEY CITY, N. J. St. Peter's College, 2641 Hudson Blvd., Jersey City, N. J.

▲ Frank Adamucci, 8 S. Gladstone Ave., Margate, N. J. Separate Contracts, $2,400,000. 300-unit RESIDENTIAL DEVELOPMENT, Harding Lakes area, MAYS LANDING, N. J.

▲ Anthony Morland, Emery Ave., Trenton, N. J., CA, $2,580,000. 100-unit RESIDENTIAL DEVELOPMENT and swimming pool, TRENTON, N. J. Shaba Kunk Hills, Inc., c/o J. C. McCarthy, 1203 Parkside Ave., Trenton, N. J.

▲ George H. Evans & Co., 1914 Spring Garden St., Phila., Pa. CA $1,227,632. general contract SENIOR HIGH SCHOOL, PHOENIXVILLE, PA. Phoenixville Area Joint School Bd., Phoenixville, Pa. CD 1/28, under LB.

Frank H. Wilson & Co., 125 Coulter Ave., Ardmore, Pa. LB $860,600. DORMITORY and DINING UNIT and retaining walls, PHILA., PA. Moore Institute of Art Science, 1020 Race St., Phila., Pa. Bids Mar. 15, CD 2/28.

▲ Lauter Constr. Co., 112 S. 16 St., Phila., Pa. CA $1,000,000. MAINTENANCE and OFFICE, PHILA., PA. Phila. Transportation Co., 1405 Locust St., Phila., Pa. Bids Mar. 8. CD 3/8;
Eric Ericson, 405 W. Chelten Ave., Phila., Pa. CA $120,000. conversion car barn into BUS GARAGE (Phila., Pa.).

▲ Davis, Wick, Rosengarten Co., 613 15 St. N.W., Wash., D. C., CA Est. $1,000,000. 3 story, brick, concrete, stone SCHOOL, 3915 Wisconsin Ave. N.W., WASH., D. C. National Radio Institute, 16 and U

Sts. N.W., Wash., D. C. Aubince, Edwards & Berry, 1515 19 St. N.W., Wash., D. C., archts. CD 12/1.

▲ **Bernard Jenkins**, c/o owner, CA $3,500,000. HOUSING, known as Harbor Estates, Clinton and 5 Sts., DELAWARE CITY, DEL. Hen Sel, Inc., c/o Carl A. Roeper, 600-A Delaware Ave., Wilmington, Del.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 6 Alabama, Kentucky

STREETS AND ROADS

April 6 Alabama, Kentucky April 18 Louisiana

▲† **Fla., Jacksonville**—BUILDING REPAIRS—BA: On Or About 4/27. U. S. Eng., P.O. Box 4970, Jacksonville, Zone 1, building repairs (FY-56), U. S. Army Reserve Training Center, Jacksonville Naval Air Station, Serial No. ENG-08-123-56-56. CD 12/3/51.

BUILDINGS—BA

▲ **La., Lake Charles**—PLANT—Bids Asked—Petroleum Chemicals, Inc., Lake Charles, Continental Oil Co., P. O. Box 2197, Houston, Tex., and Cities Service Co., 60 Wall St., New York 5, N. Y., anhydrous ammonia mfg. plant. $12,500,000.

HEAVY CONSTRUCTION—LB & CA

▲ **Thorington Constr. Co.**, 2106 N. Hamilton St., Richmond, Va., CA, $1,396,275. Div. 1, grit chamber and sedimentation tanks at site of sewage treatment plant, adjacent to southwest bank of James River at Rockett's Wharf, RICHMOND, VA. City, Mosque Bldg., Laurel and Main Sts., Richmond, Va. Bids Feb. 14. CD 12/29.

▲† **Noonan Constr. Co., Inc.**, Box 470, Pensacola, Fla., CA, $1,119,064, operational parking area, access road, Forrest Sherman Field, NOY 86979, Spec. 46088, PENSACOLA, FLA. Officer in Charge of Constr., Bldg. 45, Naval Air Station, Pensacola, Fla. Awarded Mar. 14. CD 2/20, under LB.

BUILDINGS—LB & CA

▲† **Blake Constr. Co.**, 33 E. St. S.W., Wash., D. C., CA $1,438,000. CHAPEL and ADMINISTRATION BLDG., Marine Corps Schools, NOY 93288, QUANTICO, VA. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids Feb. 8. CD 2/10, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Wisconsin** BA 4/2. Northern States Power Co., 2 S. Barstow St., Eau Claire, substructure, superstructure and mechanical and electrical work for dam on Red Cedar River, Menomonie. $2,803,300. Pioneer Service & Eng. Co., 231 N. La Salle St., Chicago, Ill., engr. CD 9/9.

BUILDINGS—LB & CA

▲ **Wm. A. Berbusse, Sr., Inc.**, 101 Park Ave., New York, N. Y. CA Est. $3,800,000. SEMINARY, 245-acre site, southeast corner Centerville Sta. Rd. and Clyo Rd., CENTERVILLE, O. Cincinnati Province, Order of Friars Minor, Franciscan Order, Father Vincent Kroger, 1615 Vine St., Cincinnati, O. Bids Feb. 25. CD 2/1.

▲ **Maxon Constr. Co., Inc.**, 2600 Far Hills St., Dayton, O., CA Est. $2,500,000. 150,000 sq. ft. PLANT for mfg. corrugated shipping boxes on Rte. 35, northwest side of EATON, O. Hinde & Dauch Paper Co., 407 Decatur St., Sandusky, O. Awarded Mar. 13. CD 9/20.

▲ **Inman Constr. Co.**, 2900 W. Jefferson St., Louisville, Ky., LB $1,150,000. 1 story, no bsmt., 175,000 sq. ft. face brick, block 35-suite Miracle Mile SHOPPING CENTER, CLARKSVILLE, IND. Miracle Mile Shopping Center, 1701 W. Burnett St., Louisville, Ky. Bids Mar. 15. CD 3/6.

▲ **Gus K. Newberg Constr. Co.**, 2040 N. Ashland Ave., Chicago, Ill., CA Total est. $47,000,000, substructure for POWER HOUSE, NEW ALBANY, IND. Public Service Co. of Indiana, 1100 Main St., Plainfield, Ind. Bids Feb. 21. CD 2/17.

▲ **Shier-Pierce Builders, Inc.**, 639 S. 51 St., Belleville, Ill., Owner Builds, $1,000,000. 300 RESIDENCES, Bridgedale Park Subdivision, Route 157, CAHOKIA (East St. Louis, P.O.), ILL.

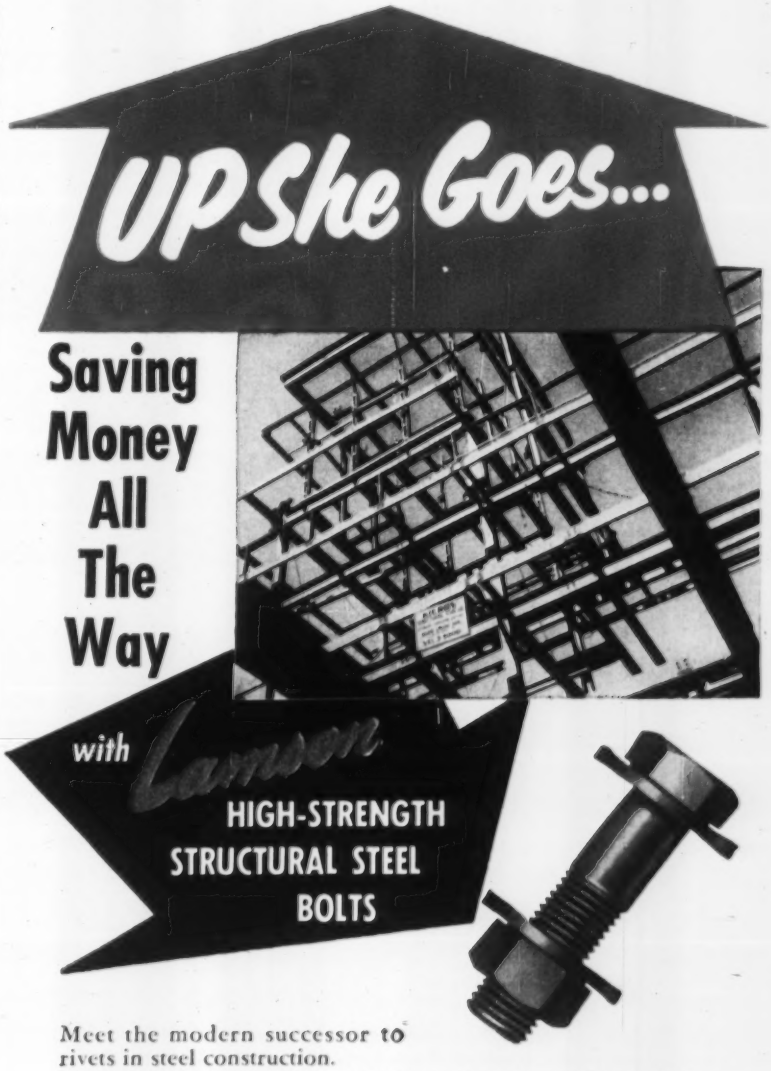
▲ **Joseph J. Duffy Co.**, 4994 Elsto St., Chicago, Ill., CA, $1,604,468, Philo Carpenter SCHOOL, 1250 W. Erie St., CHICAGO, ILL. Bd. Educ., 228 N. La Salle St., Chicago, Ill. Awarded Mar. 14. CD 3/14, under LB.

▲ **Greta Lederer**, 330 Tudor Court, Glencoe, Ill., Own Forces, $1,700,000, 70 HOMES, GLENCOE, ILL. Milton Schwartz, 20 E. Huron St., Chicago 11, Ill., archt.

▲ **Highbridge Homes, Inc.**, 1717 Mulford St., Evanston, Ill., Own Forces, $1,500,000. 75 HOMES, HIGHLAND PARK, ILL.

▲ **Hamann Constr. Co.**, 408 Commercial St., Manitowoc, Wis., CA $1,033,240, general contract, CITY HALL, GREEN BAY, WIS. City, City Hall, Green Bay, Wis. Bids Mar. 1, awarded Mar. 14. CD 3/14, under LB.

Seth E. Giem & Assoc., Kalamazoo, Mich. CA $848,500. 6-story NURSES' HOME, Bronson Methodist Hospital, KALAMAZOO, MICH. Bronson Hospital, Dr. William O. Perdew, supt., Kalamazoo, Mich. CD 3/7, under LB.



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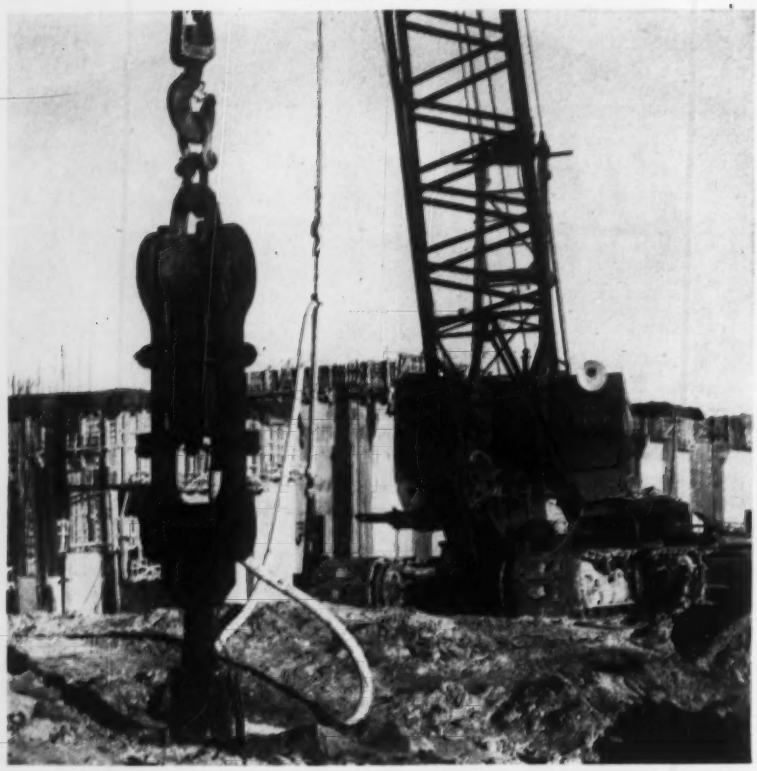

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WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
April 3 Iowa
STREETS AND ROADS
April 3 Iowa April 6 Minnesota

BUILDINGS—BA

▲ Tex., Corpus Christi—HIGH SCHOOL—BA 4/11—Corpus Christi Independent School Dist., 515 N. Carancahua St., Mary Carroll Senior High School, $1,500,000. Plans deposit $25. Smyth & Smyth, Gulf Security Bldg., archts. B. J. Osborne, 3935 Lowman St., Corpus Christi, and T. A. Vernor, 304 Greene Ave., Taft, engrs. CD 2/1/55.

▲ Colo., Greeley—DORMITORIES, etc.—BA 4/24—State College of Education, Campus, Greeley, two 3 story dormitories, 2 story existing dining hall addn., $2,000,000. Robert F. Lindstedt, 625 W. 14 St., Denver, engr. Swanson-Rink & Assoc., 1707 Gilpin St., Denver, archts. Murray Rilley & Assoc., 820 23 St., Denver, mech. archts. CD 3/13.

▲ Minn., Rochester—TREATMENT—BA 4/26—State, Dpt. Admin., P. T. Peterson, dir. Purchases, 19 State Capitol, St. Paul, constr. continued treatment bldg. at Rochester State Hospital. $1,250,000. Plans deposit $100 each for general, mechanical and electric. Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, archts. CD 7/29.

HEAVY CONSTRUCTION—LB & CA

† Ricks Constr. Co., Box 4027, N. Austin Station, Austin, Tex., CA, $982,611. A. C. and W. Station, Rockport Air Force Base, ENG-41-243-56-39, ROCKPORT, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Feb. 14, awarded Mar. 14. CD 2/23, under LB.

▲† Sound Constr. & Engineering Co., 1300 Aloha St., Seattle, Wash. CA $2,383,069. 26 bldgs., 2 igloos, utilities, development of sites, other facilities, Glasgow Air Force Base, ENG-45-164-56-7, GLASGOW, MONT. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Feb. 24, awarded Mar. 9. CD 2/28, under LB.

BUILDINGS—LB & CA

A. Hedenberg & Co., 4621 E. Superior St., Duluth, Minn. CA $967,400. general constr. addn. and remodel West Junior High and Elementary SCHOOL, Central Ave. and W. 6 St., DULUTH, MINN. Bd. Educ., H. J. Forsberg, clk., Duluth, Minn. CD 3/15, under LB.

▲ Vulcan Copper Supply Co., 120 Sycamore St., Cincinnati, O. CA Est. $2,000,000. design and construct 7 m.g. per year methanal PLANT, LOUISIANA, MO. Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del. CD 3/5.

Fegles Constr. Co., 711 Wesley Temple Bldg., Minneapolis, Minn. CA Est. $1,400,000. GRAIN ELEVATOR and TERMINAL, incl. facilities for loading barges and railroad cars on Hy. 79 at southern edge of city, LOUISIANA, MO. Missouri Farmers Assoc., Columbia, Mo. CD 12/11/53.

▲ Dillon Realty Co., 3420 Jones St., Omaha, Neb. Owner Builds. $1,000,000. resurg. HOTEL at Lake Okoboji, OKOBOJI, NEB. Inn Hotel Co., lessee.

▲ Williams & Dunlap Housing Corp., 2722 Eastern St., Dallas, Tex. Owner Builds. $2,000,000. Westway Village SHOPPING CENTER, Seneca and Pawnee Sts., WICHITA, KAN. Feagins, Kirsch & Feagins, 4007 E. Kellogg St., Wichita, Kan., archts.

▲ Mike Campbell Constr. Co., Box 8428, Tulsa, Okla. CA $1,279,261, Cameron Street Junior HIGH SCHOOL, TULSA, OKLA. Bd. Educ., 410 S. Cincinnati St., Tulsa, Okla. Bids Feb. 22. CD 2/9.

▲ Fisher Constr. Co., Inc., 4711 Greeley St., Houston, Tex., CA, $2,171,600. West Bellaire Junior High SCHOOL, south side of Bellaire Blvd., HOUSTON, TEX. Houston Independent School Dist., 1300 Capitol St., Houston, Tex. Bids Feb. 16, awarded Mar. 12. CD 2/24, under LB.

▲ Westcraft Homes, 5310 Johnson St., Arvada, Colo. CA Approx. $2,000,000. SHOPPING CENTER (1st unit), supermarket, variety store, 13 small shops, 60,000 sq. ft., ARVADA, COLO. Arvada Square, 5310 Johnson St., Arvada, Colo.

▲ Floyd A. Harrison Assocs., 2117 NW. Britton St., Oklahoma City, Okla., LB $2,579,000. construct and finance family HOUSING, Inv. 25-066-56-45, CAMP CARSON, COLO. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 20. CD 2/1, under Public Buildings.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
April 11, 12, 18, 19 California April 17 Washington
STREETS AND ROADS
April 11, 12, 18 California

▲† California—BA 4/24—U. S. Eng., 751 S. Figueroa St., Los Angeles. Eaton Wash Channel, Huntington Dr. to Encinita Ave., Temple City, Los Angeles Co., CIVENG-04-353-56-44. $2,000,000. CD 4/21/44.

BUILDINGS—SLC

▲ Calif., Oakland—COLLEGE—BA 4/10—College of the Holy Names c/o Milton T. Pflueger, archt., 580 Market St., San Francisco, Unit 2, science, classroom, library, administrative office bldg. at college. $1,050,000. CD 10/18.

Calif., San Francisco—SCHOOL—BA 4/11—City and San Francisco Co., Dpt. P. Wks., City Hall, Ridgepoint No. 2 Elementary School, Hunters Point. $945,000. Plans deposit $200. T. F. Fitzgerald, 320 Clay St., engr. John Gloe, 362 Clay St., archt. CD 6/30, under LB.

▲ Calif., Bakersfield—HIGH SCHOOL—BA 4/23—Kern County Joint Unified High School Dist., 2000 24 St., high school on south side of Bakersfield. $3,000,000. Plans deposit $250. Ernest L. McCoy, 2811 "H" St., archt. CD 1/7/54.

BUILDINGS—SLC

▲ Calif., Burlingame—WAREHOUSE, etc.—Sylvania Electric Products, Inc., P.O. Box 750, Williamsport, Pa., soon lets contract 75,000 sq. ft. warehouse and office. $1,000,000. John S. Bolles, Pier 5, San Francisco, archt.

HEAVY CONSTRUCTION—LB & CA

▲ Guy F. Atkinson Co., 5315 N.E. 101st Ave., Portland, Ore., LB $6,534,349 (3 bidders) concrete arch dam, power house and spillway, reregulating dam, fish ladder, Pelton Dam Proj., Jefferson Co., OREGON. Portland General Electric Co., 610 S.W. Broadway, Portland, Ore. John Bankus, c/o owner, engr. Bids Mar. 16. CD 2/15.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

J. E. Haddock Ltd., 3538 E. Foothill St., Pasadena, Calif., CA $1,477,870, wid'n 4.8 mi. U. S. 101, Whittier Blvd., Los Angeles Co. Bids Feb. 16, awarded Mar. 15. CD 2/23, under LB.

▲†Hydraulic Dredging Co., First Western Bank Bldg., Oakland, Calif., LB $2,237,780, est. $2,315,940 (3 bidders) Sacramento deep water channel dredging, CALIFORNIA. U. S. Eng., 1209 8 St., Sacramento, Calif. Bids Mar. 20. CD 2/9.

▲†Price-McNemar Constr. Co., 8601 Sepulveda Blvd., Sepulveda, Calif., LB $1,000,144, est. $1,149,269, second Nike and facilities, Travis Air Force Base, Fairfield, Solano Co., CALIFORNIA. U. S. Eng., 1209 8 St., Sacramento, Calif. Bids Mar. 16. CD 3/14.

BUILDINGS—LB & CA

▲ W. H. Shields Constr. Co., 252 Taylor St., Eugene, Ore. LB $1,444,973. HIGH SCHOOL, LEBANON, ORE. Lebanon School Dist., Lebanon, Ore. Freeman, Hayslip, Tuft & Hewlett, 2040 S. W. 3 St., Portland, Ore., archts.

▲ Duff & David, Box 128, Garden Grove, Calif., CA, $1,019,048, 68 stucco DWELLINGS, Tract 2702 GARDEN GROVE, CALIF. Brookside Estates, Inc., Box 128, Garden Grove, Calif.

▲ Hale Co., 8002 Central Ave., Garden Grove, Calif., CA, $1,710,000, 171 frame stucco DWELLINGS, Tract 2611, STAUNTON, CALIF. Lincoln-Western Co., 8002 Central Ave., Garden Grove, Calif.

CANADA

HEAVY CONSTRUCTION—SLC

▲ Ontario—PIPE LINE—Imperial Oil Ltd., 56 Church St., Toronto, soon lets contract, 38-mi. 12-in. diam. pipe line from Toronto to Waterdown. $1,000,000. C. W. Martin, c/o owner, engr., supvr. of construction. CD 3/19.

BUILDINGS—LB & CA

Bennett & White Constr. Co., Ltd., 660 Howe St., Vancouver, B. C., CA, $908,479, 1½ and 2 story POWERHOUSE and PROSTHETICS SERVICE BLDG., Shaughnessy Hospital, VANCOUVER, B. C. Federal P. Wks. Dpt., Hunter Bldg., Ottawa, Ont. Awarded Mar. 6. CD 2/15, under LB.

ALASKA

BUILDINGS—BA

▲† Alaska, Fort Greeley—QUARTERS—BA 4/24—U. S. Eng., 4735 E. Marginal Way, Seattle, Wash., constr. family quarters, bachelor officers quarters for women and non-commissioned officers open mess, Inv. 56-41. $2,500,000.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ Campenon Bernard, Paris, France, CA Est. $2,500,000. Caronia dam and hydro electric plant, Bolivar State, VENEZUELA. Ministry of Development, Caracas, Venezuela. CD 6/10.

FOREIGN

HEAVY CONSTRUCTION—LB & CA

▲ Cape Steel Constr. Co. and Murray & Stewart, Carlisle St., Paarden Eiland, Capetown, Union of South Africa, LB $2,956,000, Contr. 2, water supply, PORT ELIZABETH, UNION OF SOUTH AFRICA. City of Port Elizabeth, Town Clerk, City Hall, Port Elizabeth, Union of South Africa. Bids Mar. 15. CD 12/15.

Soccoman, French Morocco, LB $2,127,000, Stage 3, materials Union of South Africa.

(Proposal Advertisements see p. 82 to 84)

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BALANCED DIGGING POWER
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Yes, there are decided differences between OWEN clamshell buckets and clamshell buckets.
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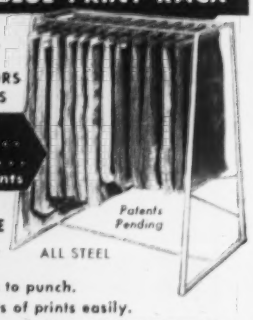

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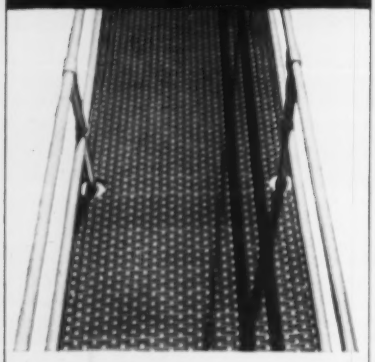

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Unit Prices

California Saves 41.8% on Office Building

The unit costs that enabled California's Department of Public Works to return $4,370,276 to the State Treasury out of its Department of Employment Office Building Fund are reported here three ways: 1 as cost per sq ft, 2 as percent of total cost, and 3 as unit cost of items per sq yd of wall and sq yd of plaster.

The contracts add up to $6,079,724 or $12.40 per sq ft. But the State furnished materials that cost another $124,800 which brought the total to $6,204,524, or $12.65 per sq ft.

Contracts

	Cost	$ sf
Site preparation	$23,790	$0.05
Concrete piles	187,173	0.38
Pile caps	77,560	0.16
Structural steel work	560,382	1.14
General work	2,830,000	5.77
Electrical work	583,583	1.19
Plumbing work	168,960	0.34
Heating & air conditioning	1,113,736	2.27
Elevators	533,000	1.10
Street lighting relocation	1,540	
Total	$6,079,724	$12.40

Contracts went to George A. Fuller Co., Los Angeles, for general work and to M. R. Carpenter, Sacramento, for heating and air conditioning. Other major contractors include Collins Electrical Co., Inc., Sacramento, Bethlehem Pacific Coast Steel Corp., San Francisco and Westinghouse Electric Corp., Elevator Division, Jersey City.

State Furnished Items

	Cost	$ sf
Finish hardware	$25,000	$0.051
Mechanical services	12,500	0.026
Electrical services	IEC	
Clock & fire alarm system	IEC	
Intercom & Public Address system	10,000	0.020
Conference room seating	IGC	
Ground improvements	18,500	0.038
Kitchen equipment	35,000	0.071
Sacramento Municipal Utility District P, T&T relocations	9,517	0.019
Signal relocation	6,283	0.013
Control equipment	8,000	0.016
Blinds	IGC	
Total	$124,800	$0.254
Total cost of building	$6,204,524	$12.654

• IEC included in Electrical Contract
• IGC included in General Contract

This steel frame and steel deck structure is 683 ft long, has a maximum width of 274 ft and an overall height of 110.5 ft including the elevator penthouse. Except for the five-story section that bridges the street with a 74 ft span, the building has seven floors, all 13 ft 4 in. high.

About 490,150 sq ft of building area cover office space for more than 3,500 employees, an auditorium with 192 seats, a cafeteria for 490 persons that can also be used as an assembly room, shops, and storage space.

Modern facilities include a complete heating and air conditioning system with 8.5 miles of ducts, fluorescent lights with 76 miles of wiring, six passenger and three freight elevators, a mail conveyor, a dumbwaiter, and an escalator from the first to the fourth floor. For additional design data see ENR March 1, 1956, p. 30/31.

Items of Cost	Unit	Quantity	IC U P	% of Total
Site preparation	ls	job	$23,790	0.39
Piles, conc, 9"x32'	ea	1,698	110.23	3.08
Pile caps	ea	1,698	45.62	1.28
Structural steel	t	3,023	185.37	9.22
Cellular deck, floors, 16 ga	sf	323,000	1.318	7.00
roof, 18 ga	sf	85,000	1.035	1.44
Conc, reinf stl, forms cement work	cy	14,682	57.92	14.15
Masonry, walls, hollow conc blocks & tiles, 8" & 6"	sf	2,600	2.45	0.10
Carpentry & millwork, incl wood doors	ls	job	110,483	1.81
Iron, orn & misc, incl stairs & rails	ls	job	147,945	2.42
Doors & frames, hollow metal	ls	job	17,694	0.29
Sash, steel	sf	27,727	1.99	0.90
Sheet metal	ls	job	58,340	0.96
Roofing	sq	750	40.00	0.49
Insulation, cane-fiber, 2"	sf	55,656	0.50	0.45
Plaster, sprayed-on	sy	45,494	3.75	2.80
1"	sy	6,142	4.50	0.44
½"	sy	1,851	4.25	0.13
Tile, acoustic & gypsum board	sf	350,000	0.68	3.91
Tile, acoustic, other	ls	job	31,287	0.51
Dry wall	sf	188,000	0.51	1.56
Painting	ls	job	65,965	1.08
Glazing	sf	34,000	0.67	0.37
Tile, asph flooring	sf	265,000	0.25	1.09
ceramic	sf	16,300	0.16	0.43
Terrazzo	sf	3,450	2.00	0.11
Marble facing, 1"	sf	2,400	4.00	0.17
Tile, marble & Terazzo, misc	ls	job	7,084	0.11
Floor covering, other	ls	job	25,300	0.41
Partitions, movable, 7'	lf	1,400	14.38	0.32
9'	lf	528	17.99	0.15
other	ls	job	18,647	0.30
Conveyors, vertical, 6 sta	ls	job	33,850	0.55
Yardwork, pave & fence	ls	job	42,952	0.70
Misc work	ls	job	86,229	1.41
Electrical work	ls	job	583,583	9.60
Plumbing	ls	job	168,960	2.78
Heating & ventilation	ls	job	1,113,736	18.32
Elevators	ls	job	533,000	8.77
Total price			$6,078,184	100%
Grand total incl street lighting relocation			$6,079,724	

Air Terminal Steel Work

The fabrication and erection of 2,050 tons of structural steel for the Terminal Building of Miami International Airport will cost the Dade County Port Authority $708,540.

Sheffield Steel Products, Inc. got the contract on their low bid that was 26.5% over the architect-engineer's estimate and 8.3% below the second low bid.

Steward & Skinner, Architects, Miami, Florida, are architect-engineers.

The two low bidders are:

1C Sheffield Steel Products, Inc	$708,540
2 Lehigh Steel Company	867,480
EE Steward & Skinner, Architects, Miami, Fla	560,000

Bids: 12-27-55

Items	Unit	Quantity	Unit Prices 1C	2
Str stl for main bldg	t	1,510	$356.00	$418.00
for finger piers	t	220	343.00	475.00
Bar joists	t	520	2,100.00	630.00
Clean-up	ls	job		900.00

Start: July 15, 1956; Complete: October 24, 1956
Liquidated damages: $200.00 per day

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Apr 5—Cement, Aggregate, Ready-mixed Concrete, Asphalt
- Apr 12—Iron and steel Products, Pipe
- Apr 19—Wood Products, Glass, Explosives, Chemicals
- Apr 26—Clay Products, Lime, Plaster, Paint, Roofing

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, in paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$148.25p	$148.25p	$296.50p	$333.55p	.....	.....	$32.44p	$42.44p	$32.70	$23.50	$24.50
Baltimore	202.00	215.00	405.00	458.50	596.00	681.00	36.00d	41.00d	33.00	22.00	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00gg	33.35	22.30	26.33
Boston	205.00†	218.40†	459.00†	467.80†	.....	.....	40.00p	44.00p	35.70†	30.00†	.....
Chicago	138.00	145.00	280.00	.....	.....	.....	28.00	30.00	36.00	29.00	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00	288.00	314.00	45.00f	46.00f	28.50p	24.25p	28.50
Cleveland	195.00**	207.00**	.....	.....	.....	.....	40.00	42.00	29.75	24.75	33.50ee
Dallas	.....	152.00	.....	.....	.....	.....	27.75	45.00	32.00	31.00	.....
Denver	.....	.....	.....	.....	.....	.....	34.00	41.00	34.90bb	28.00bb	34.00bb
Detroit	192.00	204.00	383.00	.....	559.00	640.00	41.00cc	46.50cc	36.00	32.00	.....
Kansas City	127.50	147.50	270.00	270.00	340.00	400.00	29.25	29.25	32.00	27.50	28.50
Los Angeles	r	r	r	r	r	r	27.50§	.....	34.00	34.00	35.00
Minneapolis	185.00p	206.00p	422.00p	206.00pw	.....	.....	43.00*p	50.00	42.00bbe	32.00bbe	44.00bbde
Montreal	164.00aq	178.00au	325.00au	270.00	288.00	.....	39.50	46.00	39.20	22.00	13.78w
New Orleans	180.00	180.00	340.00	380.00	.....	.....	35.00	35.00	30.60	21.50	21.50
New York	158.10h	168.60h	231.70ch	255.20hn	.....	.....	44.00	.....	37.00	35.00	.....
Philadelphia	156.30	166.80	312.70	375.20	.....	.....	30/34	34/40	27.60	25.60	3.17
Pittsburgh	154.00	162.00	292.00	340.00	420.00	495.00	36.00	46.00y	32.00	29.50	2.97ss
St. Louis	162.00cc	175.00cc	358.00cc	500.00cc	.....	621.50	43.00af	41.50c	95.00aa	80.00aa	1.35aaappp
San Francisco	156.85a*	177.10a*	235.30ddo*	.....	.....	.....	39.50*	39.50*	26.60	26.60	30.50
Seattle	225.00cc	250.00cc	350.00cc	250.00ccw	.....	.....	43.00a	55.00a	46.00aAA	37.50AA	3.90mAA
Toronto	138.70	148.90	273.75	222.00jf	.....	.....	41.50	59.00	40.00	33.50	30.00

*† F.o.b. yard Roxbury. *a Smooth. *b Per 50 lb. bags. *c 6 x 12 x 12 in.-3 cell. *d Pulverized hot. *e 5%, 10th following month. *f 8 x 8 x 12. *g 8½ x 8 x 12. *h F.o.b. trucks, job site N.Y.C. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. *n 7⅝ x 7⅝ x 12. Speed title. *p Truck lots. *q Provincial and Municipal tax extra. *r Not used because of earthquake danger. *s 2% discount for cash. *t 8½ x 8 x 11¼. *u Tax exempt. *v Sand lime. *w 8 x 8 x 12. *y Stacked. *z Pebble lime price per 80 lb. sack. *aa Price per sack. Lime not sold per ton. *bb LCL. *cc Truck delivery. *dd 8 x 12 x 12. *ee Pebble lime. *ff 80% common. *gg Rough, $40.00 Smooth. *hh Icl. § F.o.b. yard *** Warehouse delivery. ** F.o.b. plant Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 380 lb. bbl. per ton
Atlanta	$18.25	$28.275	$3.59	$3.86	$3.31	$3.00	$2.81	$2.81	$0.60	$55.00
Baltimore	18.00	27.90	2.75	4.25	3.35	2.78	4.25	4.25	48	50.18
Birmingham	18.25	28.275	3.90	3.40	....	3.00	2.55	2.55	75ff	33.50ee
Boston	18.00	27.90	....	....	....	2.86qq	2.66oo	2.66oo	45q	50.50q
Chicago	18.00	27.90	....	....	....	3.20‡w	2.86‡o	2.86‡o	43.50‡bbe	50.50‡
Cincinnati	18.00	27.90	....	....	....	3.00	2.55	2.55	594y	49.38
Cleveland	18.00	27.90	2.47pqq	2.84qq	2.81qq	3.00q	2.55a	2.55a	45q	44.00AA
Dallas	18.25	28.65	....	ff4.05	....	3.50q	3.75a	4.35a	.38	58.50AA
Denver	18.50	28.40	3.29	5.15	3.04	2.53	1.90a	2.60a	.49ff	45.00
Detroit	18.00	27.90	2.35	3.25	2.50	2.53	2.28f	2.28f	.56	46.00
Kansas City	18.00	28.65	3.64	3.12ps	2.76	3.31	3.16a	3.16a	52	75.91
Los Angeles	18.00	28.15	3.30n	4.50n	4.20n	2.90n	2.05cn	l	84ny	l
Minneapolis	18.00	29.88/28.02	....	....	....	2.70dd	2.295kdd	2.295kdd	.48kdd	44.00r
Montreal	.....	21.95	4.65Dff	5.50Eff	4.30Fff	....	....	....	....	....
New York	18.00	27.90	....h	....	....	2.70G	2.30Ga	2.30Ga	.63Ga	44.00**
Philadelphia	18.00	27.90	3.60	3.40/3.65	3.50/4.60	2.84	2.94	2.94	.37	26.00
Pittsburgh	18.00	27.90	3.10	3.36	3.68	2.72	2.60a	2.60a	.42	52.00
St. Louis	18.00	27.90	....	....	....	2.70	2.30A	2.30A	.52y	51.25
San Francisco	18.00	28.15	2.95	4.15	3.40	2.62	1.75ee	....	.44	.....
Seattle	18.00	28.40	3.30mee	4.02mee	....	3.42mgee	2.91Amee	....	.55mee	52.00mee
Toronto	.....	.....	....	....	....	4.45	4.10	....	1.60	89.00

*‡ Delivered. * Note: Red lead in oil 50c higher than white lead in oil. *a Red lead prices change frequently due to pig lead price changes. *b U. S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lb. *f Per 432 sq. ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload lot prices; Minneapolis and vicinity. *k Per cwt. *l Not used *m 1% discount for cash. *n F.o.b. city. *o Per 60-lb. roll. *p 5-drum, 50 gal. ea. *q Per 90-lb. roll. *r F.o.b. factory, Chicago. *s 486 Med. *t Federal tax included, add 5% mun. & prov. tax. *u Per 90-lb. square. *v Per ton. *w Price to large paint contractors is $1.25 less *x Mineral surfaced. *y 55-gallon container. *z Drums. *aa 18, 324 sq. ft. roll *bb Roofers coating and cement; Price per ton. *cc LCL, truck delivery. *dd 2% cash discount. *ee Asphalt pitch in 100 lb. package. *ff 5-gal. drums. *gg F.o.b. factory. *hh Incl. freight. *D Std. Black. *E Ready-mixed. *F Over 80%, ferric oxide. ** Aver. wt. approx. 425 to 550 lbs. drums. fob factory points

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER† Neat per ton	Gauging per ton	VERMICULITE† Home Insulation pellets	Plaster aggregate	Concrete AGGREGATE: Treated	Untreated	ALUMINUM SHEET& Flat, .102" th 38"x96" & 48"x144" per lb‡	Corr roof .032" th 35"x12' per sh‖	STAINLESS STEEL SHEET*-TYPE 302g 20 ga 48"x96, 120" per cwt&&	28 ga 36"x120" per cwtmm	COPPER WATER TUBING-TYPE L 2000 ft lots per ft‡‡ ½"§	⅝"¢
			per bag of 4 cu ft									
Atlanta	$31.50	$38.00	$1.50*	$1.60*	$1.80*		$0.359m	$0.04n	$53.68*	$61.18*	$18.57f	$31.93f
Baltimore	24.10	34.50	0.95	1.15		$1.15	0.391	0.427r	56.25	64.25	0.21	0.30
Birmingham	38.00	43.00	1.55	1.55	1.80		0.437	9.07	55.68	65.68	0.2889	0.3639
Boston	22.00	29.00	1.15/1.20	1.18/1.23		1.30	0.44p	26.15op	55.88dd	61.65ddfff	0.1951	0.2745
Chicago	26.80	26.80	1.55	1.60	1.60	....	0.43a	8.8924p	57.55ee	65.55ee	0.1951	0.2745
Cincinnati	21.60**	21.60**	1.75	1.75	1.85	1.75	0.400	8.66	57.80	69.30ff	0.1881	0.2644
Cleveland	27.50	42.00	1.12	1.19	1.29	....	0.415aa	8.66	57.81	65.81	19.00f	32.00f
Dallas	29.80	31.80	1.20	1.25	1.30		0.379	0.439r	55.00	63.00	0.1449	0.2029
Denver	24.00	24.00	1.45	1.35		1.50	0.437	8.89	57.67gg	67.87gg	0.2214	0.3114
Detroit	25.00	25.00	1.50	1.50	1.60	1.60	0.43	8.862	57.80	65.80	17.00fee	29.83f
Kansas City	30.00	35.00	1.20	1.30	1.40		0.416	9.94	60.72ee	68.72ee	22.14f	31.14f
Los Angeles	26.20	27.20	1.25ss	1.29ss	1.45ss	1.25ss	0.44	8.14	58.00	66.00	0.1951	0.2745
Minneapolis	31.00	31.00	1.45	1.60		1.80	0.43	7.85	56.45	64.25ff	0.1951d	0.2715
Montreal	28.80	33.20	1.10	1.30	1.35	1.30	0.372	8.25	62.75		0.26	0.320
New Orleans	35.00	40.00	1.50	1.20	1.25	1.25	0.388	0.366aalbb	58.18	66.18	0.2134	0.2999
New York	24.00	30.00	1.25	1.20	1.40	1.30	0.434ee	8.504	58.42	66.42	19.51f	27.45f
Philadelphia	23.25	32.00	1.35	1.35	1.35	1.40	28.50wz	7.554	53.234	60.984	18.57f	26.06f
Pittsburgh	27.50	31.00	1.30	1.30	1.37	1.32	0.42	9.19	56.81	62.63	0.2045	0.2572
St. Louis	31.00	40.00	1.30	1.55jj	1.60jj	1.50	0.45a	8.89e	56.79kk	75.79kk	21.34fm	29.99fm
San Francisco	27.85	27.85	1.05	1.05		1.24	0.44	8.45cc	64.40	72.40	0.1951	0.2745
Seattle	33.00	38.50	1.45	1.25k	1.85		0.388	7.560	60.50ee	68.00ee	0.1951	0.2745
Toronto	32.50	42.00	1.20	1.30	1.45	1.35	0.394	21.55	58.80	92.40	0.3299pp	0.4139pp

† trucklots, delivered * carload ‡ delivered ~ *a fob city *b ½" O.D. *c ⅝" O.D. *e 2.10M ft; 10M ft & up $0.1925/ft *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h 15M lb *j 3003 alloy; 1100 alloy: $0.456/lb *k 1100 & 3003 alloy, mill finish *k per bag of 3 cu ft *l treated has air entraining agent; untreated does not *m 2-10M ft *n fob plant, fr allow *o 5M lb & up *p 100 sq ft quantity *q 2M lb quantity *r per lb *s 30¢ bag *t 36" x 96"; 10.81 lb/sh; 48" x 144" 21.7 lb/sh *u 19.31 lb/sh *v in 4M-lb skids; $0.296 lb in 1M-lb cases *w 48" x 144" *x 36" x 96" $13.25/sh *aa 18M lb & up *bb fob mill *cc 28" x 8-12' *dd add $0.75/cwt for boxing *e 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 50 4-lb. per sh *ii 300-bag lots *jj per 100-lb bag *kk mill shipment; add $2 per cwt for immediate del *mm Theoretical wt 19.7-lb per sh *nn Daily, warehouse means *oo ¼" O.D. *pp Incl 10% sales tax

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Apr 5—Cement, Aggregate, Ready-mixed Concrete, Asphalt
- Apr 12—Iron and Steel Products, Pipe
- Apr 19—Wood Products, Glass, Explosives, Chemicals
- Apr 26—Clay Products, Lime, Plaster, Paint, Roofing

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft 3/8"	1/2"	GYPSUM BOARD LATH plain or perf per Msq ft 3/8" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft 1/2" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft 1/2" sq ed	1/2" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft 1/2"	MINERAL WOOL INSULATION† loose, per 40-lb bag a	3" batts per M sf a	GLASS FIBER INSULATION† loose, per 40-lb bag a	3" batts per M sf	ALUMINUM FOIL 60# Kraft 1 side foil per roll of 250 s. f.	Expansible Blanket 2 layers foil per Msq. ft.
Atlanta	$75.00	$65.00	$45.00	$75.00	$75.00	$125.00	$75.00	$1.08	$75.00	$1.45½	$85.00		
Baltimore	51.25f	44.75f	32.55f	55.00f	65.00f	108.50f	69.00f	1.30	66.50	1.60	45.00	$4.00g	$33.50
Birmingham	79.00	65.00	51.11	82.00	77.00	130.00	76.00	1.40	70.00	1.60	75.00	3.39g	
Boston	56.00m	46.50m	33.00m	52.00m	64.00m	109.00m	79.00kn	1.45	75.00	1.40	56.00	5.80	54.50
Chicago	65.00	52.00	43.00	60.00	80.00	120.00	80.00	1.85	80.00	....	63/65½	5.25e	....
Cincinnati	46.40w	41.60w	30.80w	47.81w	65.00w	110.00w	65.00w	....	61.00	1.25	75.00	2.91	50.00w
Cleveland	60.50	55.00	40.00	65.00	70.00	111.00	70.00r	1.35/1.50	75.00	1.60**	61.50**	17.50	50/55
Dallas	58.00	55.00	42.50	65.00	73.50	122.50	70.00	1.90	68.00	1.35	65.83	4.25	....
Denver	60.00	52.50	40.00	60.00	72.90	123.00	71.90	....	71.00s	1.47	55.00	11.00r	21.00
Detroit	53.00	48.00	36.00	57.50	56.50	95.00	55.50	....	....	1.95b	77.25	....	....
Kansas City	55.00	55.00	40.00	65.00	72.00	120.00	75.00	1.40	80.00	1.40	80.00	11.24dt	19.44
Los Angeles	60.00	52.50	0.32Sz	60.00	71.87	121.25	80.00	....	83.00	1.35a	64.00	4.20g	....
Minneapolis	72.00	63.00	0.40z	80.00	70.00	114.00	70.00r	1.60	78.00	1.60	78.00	6.80	....
Montreal	56.00	48.00	36/39	53.00	60.00	....	62.00	1.10	60.00	1.10	60.00	20.00e	80.00
New Orleans	70.00	60.00	45.00	65.00	67.50	125.00	75.00	1.95	68.00**	....	....	15.86	"f" ....
New York	52.00	45.50	35.00	53.00	69.00	109.00	70.50	1.55	69.00	1.90*	72.00	5.20	48.80cc
Philadelphia	50.00	48.00	34.00	48.50	67.50	105.00	49.20	....	63/70	....	70/75	5.50/6.34	50/44.50
Pittsburgh	55.00	55.00	40.00	68.00	65.00	105.00	60.00	1.90	72.00	1.90	72.00	4.10	....
St. Louis	65.00	55.00	40.00	65.00	75.00	120.00	75.00	1.60	85.00	1.65	69.00	4.75d	....
San Francisco	52.00r	44.75	0.34z	56.00k	58.00	94.00	56.00	1.60	66.50	1.55	66.50	4.82	52.50
Seattle	57.50	50.50	40.00	59.00	71.40	120.35	70.20	1.75y	81.00	1.85aaz	61.00aa	4.25g	51.75
Toronto	61.00	50.00	40.00	64.50	75.00	....	....	0.90	51.00	....	51.00	15.86e	39.50

*a for hand packing *b per 30# bag *c carloads *d 40# kraft paper *f full trailer loads *g 80# kraft paper backing *h LCL *i flameproof $75.00 *k plain core; asph core $56/M sq ft *m 10 ton quantities *n distributor's siding *o per Msf roll *p per sf *r per cwt *s per 35# bag *t per M sq ft *w fob city *x per sq. yd. *y 25# bag z 32# bag *aa fob warehouse *bb 2" *cc in 250 sf rolls, of 18", 20", or 24" width.

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const
Atlanta	$3.25	$2.70	$2.95	$2.70	$2.875	$3.00	$3.05+10¢d	$1.40	$1.40
Baltimore	3.10+10¢d	2.95+7½¢t	3.50+7½¢tt	2.55/2.80tt	3.25+7½¢tt	3.075	3.20+7½¢tt	1.60+7½¢t	1.60+7½¢tt
Birmingham	3.50	2.60	2.925+7½¢k	2.42	2.82	3.175	3.05+7½¢k	1.50	1.60
Boston	3.25+10¢r	2.85+7½¢k	3.40+7½¢k	3.40	3.25+20¢tt	3.10+12¢tt	3.20+10¢r	2.15+7¢k	2.15+7¢t
Chicago	3.55+7½¢k	3.275+10¢r	3.425+7½¢k	3.175+5¢m	3.47+23¢r	3.48+21¢t	3.30+22¢mm	2.50+7½¢k	2.50+7½¢k
Cincinnati	3.45	3.15	3.20+7½¢k	2.925/3.175	3.225	3.375+3½¢N	3.35+9½¢d	2.20	2.10
Cleveland	3.40+7½¢k	3.40	3.325+7½¢k	3.40	3.40	3.425	3.30+10¢r	2.65	2.65
Dallas	3.625	2.875	2.95	2.875+7½¢k	3.437	3.00	3.105+8¢hh	1.50	1.50
Denver	3.50	2.975	3.00+7½¢t	2.93	3.30+7½¢t	3.00	3.05+15¢tt	2.00	2.00
Detroit	3.38+20¢mm	3.10+22½¢r	3.325+15¢tt	3.15+15¢mm	3.36+23¢t	3.35+30½¢tt	3.265+22½¢k	2.40+15¢mm	2.45+10¢r
Kansas City	3.625	2.90r	3.00	3.035r	3.375	3.05+13¢tt	3.15+7½¢t	2.10b	2.15
Los Angeles	3.60	2.90+10¢r	3.25+7½¢k	2.81+10¢t	3.625+12½¢tt	3.45	3.425+10¢r	2.20+7½¢k	2.20+7½¢k
Minneapolis	3.325	2.90	3.07	2.85	3.05+13¢mm	3.00+20¢m	3.00+7½¢k	2.15	2.15
New Orleans	3.175	2.60	2.90+7½¢k	2.80	2.80	3.025+7½¢k	3.00+10¢r	1.475	1.475
New York	3.80+35¢tt	3.55+28¢tt	3.85+35¢tt	3.90+19½¢t	3.85+50¢k	3.30+36¢tt	3.75+34¢tt	2.50+20¢tt	2.50+20¢tt
Philadelphia	3.75+17¢t	3.30	3.55+15¢tt	3.07/3.82+10¢tt	3.50+15¢tt	3.65+15¢mm	3.50+11½¢r	2.225 *	2.325
Pittsburgh	3.60+17½¢k	3.20+7½¢k	3.30+7½¢k	3.35+7½¢k	3.40+17½¢k	3.50	3.45+7½¢k	2.10+7½¢k	1.98+10¢t
St. Louis	3.75+10¢r	3.25+7½¢k	3.325	3.325	3.425+7½¢k	3.50+25¢r	3.45+21¢tt	2.30+7½¢k	2.30+7½¢k
San Francisco	3.65+10¢r	3.06+10¢r	3.25+10¢r	2.86+10¢r	3.56+7½¢k	3.22½+20¢tt	3.20+36¢k	2.175+10¢r	2.175+10¢r
Seattle	3.40+10¢d	2.80+10¢d	3.07+10¢d	2.90+10¢d	3.15+10¢d	3.16+13½¢k	3.10+21¢t	2.32+10¢r	2.32+10¢d
Montreal	2.10+14¢t	1.90+14¢t	2.00+14¢t	1.80+14¢t	2.12+18¢t	2.10+18¢t	2.12+18¢t	1.30+10¢t	1.30+10¢t
Toronto	2.46+10¢**	2.30+11¢**	2.30+9¢**	2.35+9¢**	2.40+10¢**	2.50+10¢**	2.44+10¢**	1.35+5¢**	1.35+5¢**

ENR Skilled Average (Bricklayers, Carpenters, Iron workers): $3.310. **ENR Common Average** $2.117

* Cost of living bonus now included in basic wage. † 8% fringe benefits. ** 4% vacation fund. *a 6 hr. day. *b 7 hr. day. *c 3% vac. stamp fund plus 7½¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. *d 10¢ H&WF. *e 10¢ VF. *f 8% WF. *g 11½¢ WF. *h $2.85 homes & housing plus 7½¢ WF. *i 17¢ WF. *j 10½¢ hr. WF. *k 7½¢ hr. WF. *l 4% VF. *m 5¢ hr. WF. *n 8¢ H&WF, 6% VF, 1% PF. *o 10¢ PF. *p 3% WF, 3% PF. *q 10¢ ins; 4% vac. and holiday pay. *r 4% WF and 20¢ PF. *s 5% W&PF, 4% VF, 1% NC, 6 PH. *t 7½¢ H&WF. *u 1½% PF. *v 10¢ WF. *w Negotiating. *x 5¢ VP. *y 23¢ WF. *A 15¢ WF, 15¢ PF, 20¢ B.F. *C 15¢ WF. *D 10¢ H&WF, 5¢ organ. *E 6% WF, plus travel pay per day. *F Plus $4 per day Annuity contrib. *G 3¢ Prom. *H 7¢ WF, 6% VF. *I 15¢ H&WF, 5¢ for Advtg. *J 5% WF, 6 PH. *K 11¢ WF, 12½¢ VF, 10¢ PF. *L 3% WF, 3% PF, 2% VF, 1% EF. *M 7½¢ PF. *N 1% WF. *O 10¢ WF, 1% PF. *P 10¢ hosp. ins.; 5¢ vac. *Q 1 drum, 2 drums $3.25/3.40. *R 12¢ WF and 1¢ apprentice, *S 12½¢ H and WF. *T 21¢ H, W & VF. *U 17½¢ WF, 4% VF. *V 5% WF, 3% PF. *W 2% F. *X 8¢ VF, & 7½¢ H & WF. *Y 7¢ H & WF. *Z 9½¢ WF. *aa 7¢ WF, 15¢ PF. *bb 8¢ WF. (eff. 4.1.56

	Truck drivers 1½ T	4 cy	4 cy	Tractor Operators incl. bulldozers 34-49 hp	70-100 hp	100 & over	Tractor scraper 15-16 cy	Power cranes & shovels ½ cy	¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.50	$	$	$2.425	$2.425	$2.425	$2.425	$2.95	$2.95	$2.425	$2.20	$1.60
Baltimore	1.60+7½¢tt	1.75+7½¢tt	1.85+7½¢tt	2.85/3.00tt	2.85/3.00tt	2.85/3.00tt	2.85/3.00tt	3.25/3.40tt	3.25/3.40tt	2.85/3.00tt	2.85/3.00tt	2.25
Birmingham	1.50	1.85ff	1.92mm	2.56	2.56	2.56	2.70	2.70	2.70	2.61	2.285	1.65
Boston	2.10r			3.025tt	3.025tt	3.025tt	3.025tt	3.40	3.40	3.40	2.95	2.22r
Chicago	2.08+12¢ttr			2.85+5¢k	3.00+5¢k	3.05+5¢k	2.85+5¢k	3.45+5¢k	3.45+5¢k	2.95+5¢k	2.95+5¢k	
Cincinnati	2.20mm	2.30mm	2.40mm	2.925	2.925	2.925	2.925	3.175	3.175	3.175	3.175	3.175
Cleveland	2.42	2.42	2.42	3.15	3.15	3.15	3.15	3.40	3.40	3.15d	3.025	3.025
Dallas	1.50	1.50	1.50	1.50/2.625tt	1.50/2.625tt	1.50/2.625tt	1.50/2.625tt	1.50/2.625tt	1.50/2.625tt	1.50/2.625tt	1.50/2.00tt	1.50/2.00tt
Denver	2.15	2.15	2.25	2.15	2.76	2.76	2.76	2.93	2.93	2.76	2.76	2.35
Detroit	2.35	2.35	2.35	3.20+10¢mm	3.20+10¢mm	3.20+10¢mm	3.20+10¢mm	3.20+10¢mm	3.20+10¢mm	3.20+10¢mm	2.925+10¢mm	2.58+20¢mm
Kansas City	2.115ee	2.115ee	2.19ee	2.30r	2.85ee	2.85ee	2.85ee	3.09ff	3.095ff	2.71ee	2.85ee	2.24ee
Los Angeles	2.305+7½¢r	2.305+7½¢r	2.335+7½¢r	2.90+10¢mm	2.90+10¢mm	2.90+10¢mm	3.24+10¢mm	3.06+10¢mm	3.06+10¢mm	3.06+10¢mm	2.49+10¢mm	2.41+7½¢r
Minneapolis	2.15	2.15r	2.30r	2.63	2.85r	3.07r	2.85	3.07r	3.33r	2.63	2.52	2.35
New Orleans	1.575	1.575	1.575	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.15	1.575
New York	2.12½+13¢tt	2.75+14¢hh	2.75+14¢hh	3.17½+25¢tt	3.17½+25¢tt	3.17½+25¢tt	3.30+26¢tt	4.05+32¢tt	4.05+32¢tt	3.30+26¢tt	3.30+26¢tt	2.90+14½¢tt
Philadelphia	1.925/2.1125+7½¢tt			3.07/3.82+10¢tt			3.07/3.82+10¢tt	3.07/3.82+10¢tt		3.07/3.82+10¢tt	2.89+10¢tt	2.05+10¢tt
Pittsburgh	2.20+7½¢r	2.20+7½¢r	2.20+7½¢r	2.87½+7½¢r	3.20+7½¢r	3.27½+7½¢r	3.25+7½¢r	3.35+7½¢r	3.35+7½¢r	3.25+7½¢r	3.35+7½¢r	2.20+7½¢r
St. Louis	2.30+7½¢mm			3.325	3.325	3.325	3.325	3.325	3.325	3.325	2.775	2.775
San Francisco	2.22½+10¢r	2.22½+10¢r	2.24+7½¢r	2.97+10¢m	2.97+10¢m	2.97+10¢m	2.97+10¢m	3.30+10¢m	3.30+10¢m	3.13+10¢m	2.68+10¢m	2.30+10¢m
Seattle	2.63+7½¢mm	2.63+7½¢mdd	2.83+7½¢mm	2.78+10¢m	2.95+10¢m	2.95+10¢m	2.95+10¢m	3.36+10¢m	3.36+10¢m	3.10+10¢m	2.78+10¢m	2.52+10¢m
Montreal	1.30+10¢tt	1.30+10¢tt	1.30+10¢tt	1.73+14¢tt	1.73+14¢tt	1.73+14¢tt	1.73+14¢tt	1.99+16¢tt	1.99+16¢tt	1.73+14¢tt	1.80+15¢tt	1.60+15¢tt
Toronto	1.45+6¢mm	1.45+6¢mm	1.65+7¢mm	1.90+5¢mm	1.90+5¢mm	1.90+5¢mm	2.35+9¢mm	2.35+9¢mm			2.05+8¢mm	2.05+8¢mm

*a 5¢ /hr HWF *b lower rates, straight time, other broken *c 2-axle; 10-wheel $2.15; Euclid $2.35 *d Intermediate *e bldg constr; highway $2.145 *f less than 2-t *g blade *h scoop, bldg *i scoop, road *j plus $2 pd by employer for hosp. death benefits to family *k bldg constr; steel constr $3.40 *l higher rates are union, other taken from min wage scale approved by County Commissioners Court *m 10¢ H&WF *n flatbed *o under 10 cy *p over 10 cy *q over 50 hp *r blade grader *s form and subgrade *t single *u 7½¢ HWF *v up to 6 cy *w 6-8 cy *x cat oper *y up to 3½ cy *z 3½ cy & over *aa plus approx $5.30 per wk W&PF *bb 3% WF, 2% PF, 11 PH *cc 5% WF & 3% PF *dd up to 5 cy *ee 5 cy & over *ff over 1½ T but not incl 3 *gg over 3 but not incl 5 tons *hh excavating *ii 4% VP *jj 12¢ H, W & PF *kk 7½¢ WF included in base pay *ll 8% fringe benefits *nn 8 cy or less; 8-16 cy $2.90; 16-25 cy $3.15 *oo Plus $2.25/wk WF *pp 2-5 T $1.70 *rr 12¢ WF *ss 5% WF (eff. 4.1.56

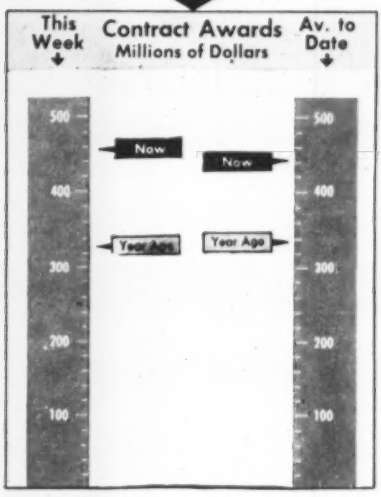
MEXICO CITY PRICES

In Pesos, F.o.b. City		Jan. '56	Feb. '56
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	2.44	2.44
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.44	2.44
Struct. Iron Workers (8 hr. day) Remachadores.	av. per hr.	3.75	3.75

Struct. Steel, Shapes		Jan. '56	Feb. '56
3"-15" x 12 meters	per metric ton	1564.34	1564.34
c fob Monterrey			
Reinf. Steel, Corr. Rods			
¼" x 11 meters	per ton	1650.00	1650.00
⅜" x 11 meters	per ton	1650.00	1650.00
½" x 11 meters	per ton	1650.00	1650.00
⅝" x 11 meters	per ton	1650.00	1650.00
¾" x 11 meters	per ton	1650.00	1650.00
1" x 11 meters	per ton	1650.00	1650.00

Gravel truck load of 3½ cu. meters		Jan. '56	Feb. '56
Blue Gravel	per tr. load	70.00	70.00
Rose Gravel	per tr. load	65.00	65.00
Cement, Std. Port. (Tolteca)	per ton	185.00	200.00
Lumber			
3rd Class Pine	per M ft.	1900.00	1900.00
1st Class Pine	per M ft.	2750.00	2750.00
2nd Class Pine	per M ft.	2300.00	2300.00

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 13 wks 1956	Chge %
	$ millions		
Federal	$55.4	$478.4	+1
State and Municipal	158.9	1,531.0	+36
Total Public	214.3	2,009.4	+30
Total Private	245.2	3,743.9	+33
U. S. Total	$459.5	$5,753.3	+32
By Type of Work			
Waterworks	$14.0	$72.8	+5
Sewerage	7.5	174.8	+83
Bridges	27.3	190.6	+66
Highways	71.2	547.0	+26
Earthwork, Waterways	32.1	178.5	+98
Buildings:			
Public, Excl. Hsg.	33.4	488.5	+15
Public Housing	2.7	103.1	+126
Private Housing	148.4	1,642.3	−6
Commercial	37.3	554.8	+38
Industrial	54.3	1,364.4	+163
Unclassified	31.3	436.5	+3
U. S. Total	$459.5	$5,753.3	+32

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

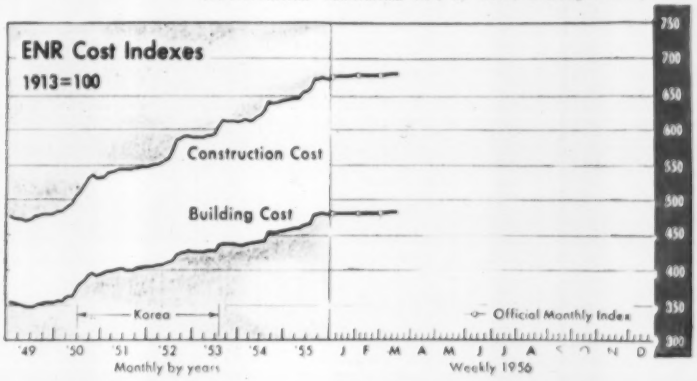
NEW CAPITAL FOR CONSTRUCTION

	Week of Mar. 22	Cum. 12 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$29.5	$614.3	−17
State and Municipal:			
All Except Housing	90.3	1,135.4	+21
Housing	...	20.3	−44
Federal Loans	0.5	22.7	+12
Federal Aid	...	...	...
Total Nonfederal	$120.4	$1,792.8	+3
Federal Appropriations:			
In U. S.	$...	$34.4	...
Outside U. S.	...	...	...
Total New Capital	$120.4	$1,827.3	+5

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	1956 Mar. 22	Percent Change from last Month	Year
Construction Cost	682.23	+0.3	+5.6
Building Cost	484.57	+0.3	+5.3

To convert above indexes to 1926=100: Divide Construction Cost by 2.000; Building Cost by 1.845. 1949=100: Divide Construction Cost by 4.770; Building Cost by 3.588.



HEAVY CONSTRUCTION BACKLOG

Millions of dollars	Feb. 29 1956	Percent Change from last Month	Year
Total U. S. (ENR reported)	$96,504	+1.4	+19.2
By Ownership—			
Private	40,606	+2.4	+20.8
State & Municipal	43,135	+0.9	+23.0
Federal	12,763	+0.03	+4.0
By Type of Work—			
Waterworks	2,036	+2.5	+24.0
Sewerage	2,989	+0.3	+3.3
Bridges	2,778	+2.4	+5.9
Highways	11,402	+0.2	+30.2
Earthwork, Waterways	11,279	+0.1	+18.2
Public Buildings	16,815	+1.6	+9.9
Industrial Buildings	15,254	+4.0	+28.9
Commercial Buildings	16,100	+2.3	+21.4
Unclassified, Private	9,252*	+0.3	+8.7
Unclassified, Public	8,599	−3.7	+30.8
By Regions—			
New England	5,136	+2.0	+29.4
Middle Atlantic	20,151	+1.6	+14.8
South	11,692	+1.6	+18.3
Middle West	17,043	+1.1	+18.3
West of the Mississippi	22,442	+1.5	+10.0
Far West	20,040	+1.2	+35.9

* Includes private bridges, $78 million

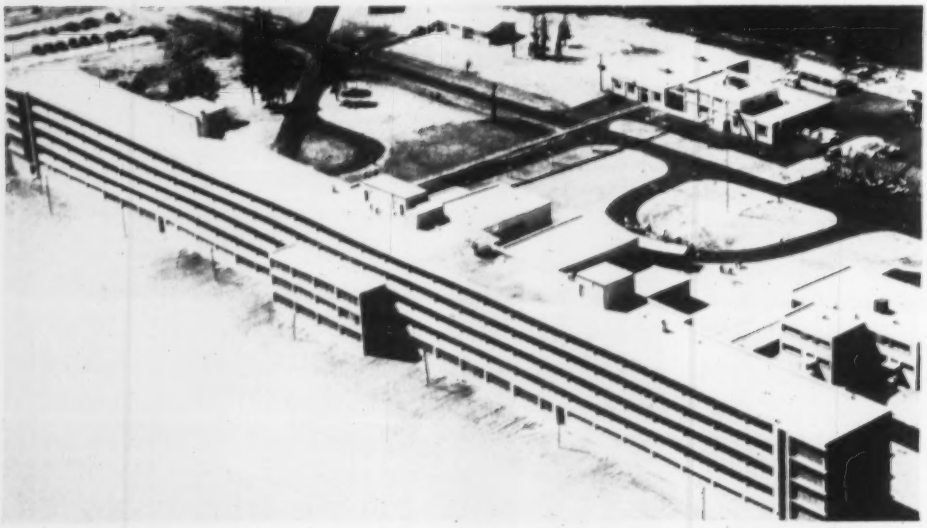
FLOW OF NEW PRODUCTS INTO THE BACKLOG

Millions of dollars	1956 Feb.	2-Months	Percent Change from '55 Feb.	Year-Cum.
Total U. S. (ENR reported)	$2,193	$5,310	+86	+84
By Ownership—				
Private	1,360	2,401	+136	+85
State & Municipal	712	2,624	+25	+73
Federal	121	285	+271	+364
By Type of Work—				
Waterworks	67	83	+177	+80
Sewerage	29	57	+204	+83
Bridges	74	115	+327	−72
Highways	114	139	+22	−56
Earthwork, Waterways	33	172	−86	−32
Public Buildings	442	820	+148	+86
Industrial Buildings	695	1,180	+246	+233
Commercial: Mass Housing	367	528	+117	+3
Other Building	233	446	+44	+42
Unclassified, Private	64	246	+97	+130
Unclassified, Public	75	1,524	+49	+1,553

Where Are You Building In The Southeast?...

CONNORS WILL PUT THE STEEL ON THE JOB WHEN YOU NEED IT!

Florida...North Carolina...Louisiana—and all other points in the Southeast are but a few short hours from Connors' centrally-located plant.



General view of new tuberculosis sanitorium in Tampa, Fla., for which Connors supplied concrete reinforcing bars. Arnold Construction Company, of Palm Beach, Fla., was General Contractor.

Backing up Connors' location advantage are Connors' standing bar stocks . . . completely integrated facilities . . . plus Connors' desire to protect its reputation for good service.

Wherever you plan to build in the Southeast, Connors will put the reinforcing steel—accurately fabricated and clearly identified—on the job when you need it.

Next time, check your reinforcing steel needs with Connors.

CONNORS PRODUCTS:

- *Reinforcing Bars*
- *Structural Shapes*
- *Hot Rolled Strip*
- *Highway Sign Posts*
- *Bulb Tees*
- *Merchant Bars*
- *Studded T Fence Posts*
- *Special Sections*

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OF PITTSBURGH

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Aiming for 120,000 units . . .

Prefab Builders Eye Bigger Market in '56

Promises of a bigger market, new materials—and more competition—greeted more than 150 representatives of the Prefabricated Home Manufacturers' Institute at their 13th annual meeting in Chicago this week.

The prefabbers, who produced 93,000 units last year, expect to turn out 120,000 this year. Assuming a total of 1,200,000 housing starts in '56, that would mean that one out of every ten homes produced this year would be prefabricated.

Housing chief Albert M. Cole told the convention that he was confident the prefabricated industry would reach its goal of 10% of the year's housing starts.

Speaking for himself and FHA Commissioner Norman Mason, Cole expressed full confidence in the soundness and durability of good prefabricated houses. He told the meeting:

"A well-planned, well-engineered prefabricated house is just as good a risk as a conventionally-built house. It will last just as long and it is capable of surviving in sound condition the period of amortization, whether the term be 30 or 40 years."

And, the Housing Administrator reiterated his earlier prediction that 1956 housing starts would total 1,300,000.

• **Dissenting opinion**—Here he parted company with another convention speaker, Joseph B. Haverstick, president of the National Association of Home Builders.

"One thing is obvious," Haverstick said. "Unless there is a complete reversal of present thinking and trends, the homebuilding industry is not likely to equal the 1,330,000 starts of 1955. . . . I've been inclined since taking office as president of NAHB to the round figure of 1,200,000—and I'm going to stick to it, at least for the time being."

Haverstick commented that areas marked by a measured and stable growth in housing probably would continue to develop that pattern in '56. "But areas of very rapid growth in the past may well be in for a period of painful readjustment," he asserted.

• **Enough but too late**—The NAHB president told the prefab homebuilders that the big question mark for the homebuilding industry right now is mortgage money. Said Haverstick:

"There are indications that mortgage money is becoming slightly easier, but the question of timing is all important. It may already be too late for that easing to have any substantial effect on spring and summer building operations."

Haverstick also predicted that 1956 will be one of the most competitive years the homebuilding industry has ever experienced.

"There will be competition for money, for suitable land and above all there will be competition with other industries for the consumer dollar," he warned. "The smart builder is not only going to produce good quality homes, he is going to have to merchandise them."

Complicating the merchandising of new homes in a competitive market will be higher pricetags on homes—regarded by the NAHB president as a certainty.

• **Testing new materials**—With the hope of establishing a closer relationship between the producers and the builders, Charles H. Topping, senior architectural and civil consultant for the engineering department of E. I. du Pont de Nemours & Co., urged creation of a research council within the prefab industry to enable manufacturers to run practical tests evaluating new building products stemming from chemistry.

He said that it is highly probable that progress of the building industry from here on will be made possible largely by development of chemical products.

New York Boosts Housing, School Aid

Schools, highways and housing took the spotlight as the New York Legislature last week wrapped up one of its most "construction-minded" sessions in years.

On the educational front, the legislature:

• Approved a constitutional amendment to authorize a $250-million bond issue for expansion of the state university. (This requires approval also by next year's legislature and then voters' approval in 1957.

• Allocated $10 million to the state university to plan the $250 million expansion program.

• Continued on a permanent basis the temporary arrangement for state contributions to building costs in rapidly-growing school districts.

• Directed the state university to set up a four-year engineering and science college on Long Island.

• **Focus on redevelopment**—The lawmakers also came up with some important construction legislation in the field of housing. Special emphasis was placed on urban renewal plans and programs for middle-income housing. In this field, the legislature:

• Authorized—subject to voters' approval—a $500-million bond issue for loans to state-regulated housing developers for construction of middle-income housing to rent for $18 to $22 a room per month.

• Appropriated $10 million for loans to municipalities and housing authorities to enable these groups to lend to private owners funds for rehabilitation and repair of tenements.

• Initiated a constitutional amendment that would set up a "little FHA" in the state. This amendment would permit state guarantee of loans to private companies for rehabilitation and modernization of tenements and for new construction.

• Authorized establishment of privately financed mortgage lending corporations by banks, insurance companies and other investment companies to make mortgage loans in areas that need rehabilitation.

• **On the highway front**—The legislators put together what appears on the surface to be an ambitious program—but in reality is not as strong as it looks. The lawmakers authorized—subject to a referendum—a $500-million state bond issue for highway construction purposes. This is a trimmed-down version of the $750-million bond issue rejected by the voters last November. The new version does not include any provision for an increase in the state gasoline tax.

(B&F continued on page 78)

It Works After All

Tennessee's plan to lure plants proven successful

Tennessee's industrial building revenue act, which first appeared to be a complete failure, now is proving to be something of a success in bringing new industry into the state.

More than $6.5 million in bonds have been sold under the act to finance construction of a dozen new factories or additions to existing industrial plants, according to records of the Tennessee Industrial and Agricultural Development Commission.

Authority for cities to issue the industrial revenue bonds originally was enacted by the state legislature in 1951. It was amended in 1953 to extend the same power to county governments.

Elizabethton was the first city to use the act, authorizing $20 million for a paper mill for the Monadnock Paper Co. and $6 million in bonds for a Textron Corp. plant. The city brought a test case into the State Supreme Court and the act was upheld. But, investment bankers blocked marketing of the bonds and both Elizabethton projects collapsed. Many assumed then that the law would turn out to be useless.

This attitude was reflected in the 1955 legislature which enacted a new law authorizing cities and counties to issue tax-supported bonds to finance new industries. No one has yet tested the validity of the 1955 act in the state courts.

Meanwhile, the commission notes increasing success in using the revenue bond law under which the industrial bonds are supported only by income from building rentals—with no obligation placed on the taxpayers.

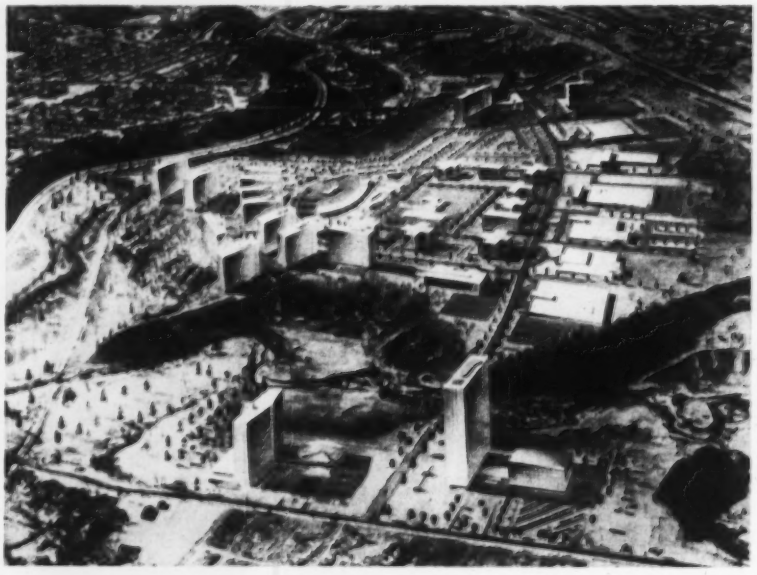
The bonds have been sold in various ways. Some were purchased by the industry using the factory, some by local citizens and others by Tennessee bankers.

Most industries prefer to have the bonds sold to the public or through a bank rather than tie up their own capital in the buildings.

But, a few industries have found the tax-exempt bonds an attractive proposition.

Payments on the bonds are deducted as a business expense for federal tax purposes. And, the interest is returned to the company as tax-free income. In one case, the interest rate was set at a comparatively high 6% to provide maximum benefit to the company under this tax gimmick.

Today, It's an Ex-Racetrack, but . . .



In 1962, a $100-Million Community

Construction will start this spring on a $100-million, six-year plan to convert a former racetrack site at Leaside, near Toronto, Ontario, into a completely planned community with 4,000 dwelling units, high-rise office buildings, industrial plants, schools, churches and parks.

The project represents a partnership of Canadian enterprise—and Canadian money—with U. S. know-how and experience. Thorncliffe Park, the official name of the development, is being financed principally by Canadian interests through sale of stock. But all design and construction will be handled by F. H. McGraw of Ontario, Ltd., a subsidiary of the big U. S. firm. Associated Engineers, Inc., of Washington D. C., are planning consultants in development of the master plan for the 388-acre site, which is on a 400-ft-high plateau, bounded on three sides by a twisting river valley.

"Mr. Wright, here's another wire from one of our distributors."

A letter or phone call to Mr. Bradford Alcorn, V. P. at TOUSEY Varnish Co., 520 West 25th Street, Chicago 16, will bring you prompt action—and may be the first step in the modernization program of your finishes.

Unpleasant news travels fast. The finish on Wright's construction equipment is showing up badly against competitors' machines. Rust and corrosion have created sales resistance in regular and potential customers.

If you face this problem, TOUSEY as specialists in the field of weather resistant finishes is capable of making a thorough survey of the finish you use and the method by which it is applied with the objective in mind of recommending whether or not: 1) a new finish should be used; 2) a new method of application should be followed; 3) or both.

We at TOUSEY are not necessarily offering a cost saving service. What we are offering is an analysis of your present methods aimed at an improvement in your finish.

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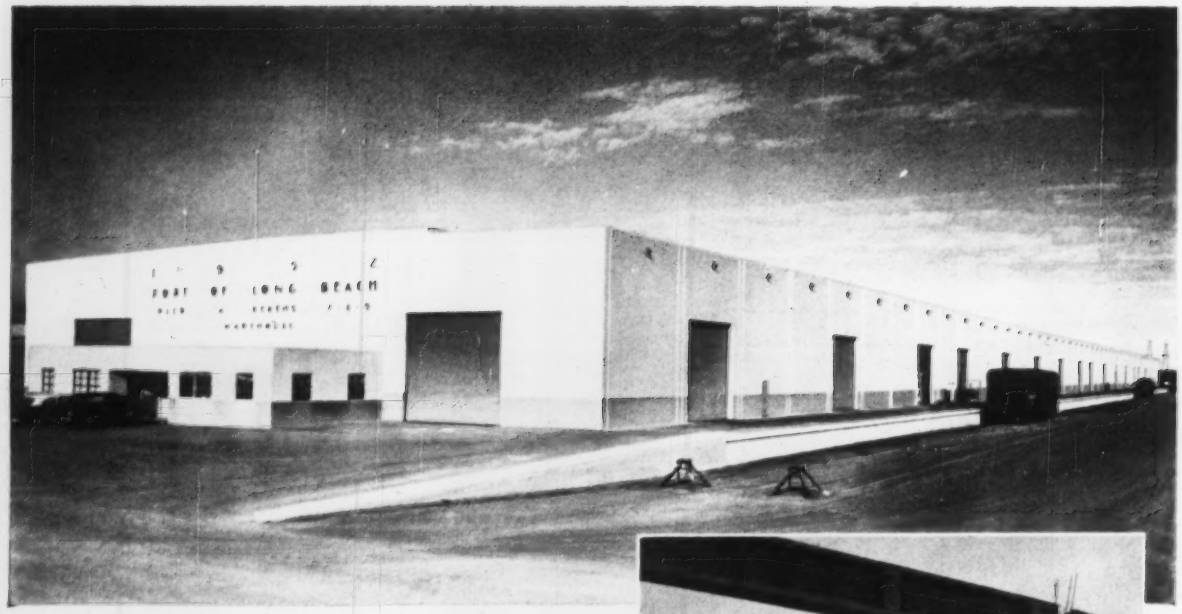


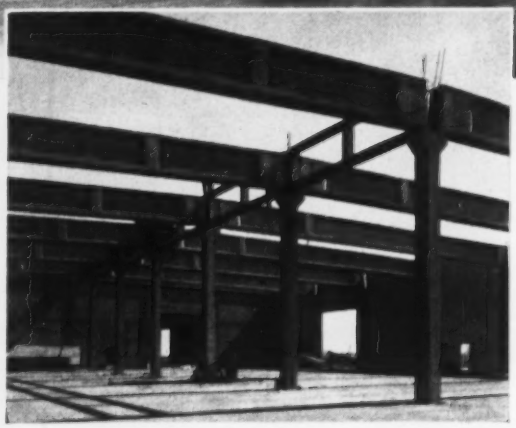
Precast and Prestressed Concrete Reduce Construction Costs

The above photo shows the "Cotton Warehouse" owned by the Port of Long Beach, Calif. It is 150 ft. wide and 1200 ft. long and has precast concrete walls, frame and roof and precast, prestressed concrete roof girders that span 75 ft. from the outside walls to a single row of interior columns down the center of the building.

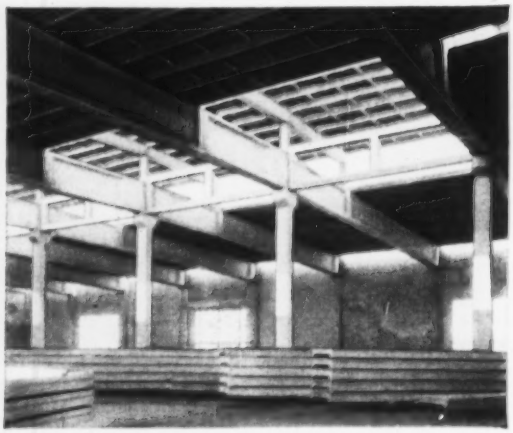
This structure is an example of the savings that result from the use of precast and prestressed concrete construction. A substantial reduction in construction time resulted from (1) starting the precasting operations at the same time that the foundation work was begun, (2) re-using the formwork frequently and (3) casting the structural units horizontally at a convenient height for the workmen. This plan allowed the workers to repeat the same operations many times. Better craftsmanship and higher quality concrete were the result.

Structures using precast and prestressed concrete units have all the advantages of conventional concrete construction. They can be designed and built to conform with all applicable building codes—anywhere. And they meet all structural requirements of great strength and durability, resistance to severe weathering, long life and ***low-annual-cost*** service. In addition, they can be built to withstand violent lateral forces caused by earthquakes, hurricanes or atomic blasts.

For additional information about precast or prestressed concrete construction write for free illustrated literature. It is distributed only in the United States and Canada.



Top photo: general view of warehouse at Long Beach, Calif. Exterior longitudinal walls are precast concrete panels 30-ft. high, 23-ft. wide and 6 in. to 8 in. thick. Photo above shows 56 in. deep, I-shaped girders supported on cast-in-place wall columns and precast interior columns. Span of the precast girders is 75 ft.



Roof constructed of precast concrete channel slabs resting on prestressed girders and precast monitor frames. Warehouse designed by the office of the late J. H. Davies, consulting structural engineer. Structural engineer was James R. Bole of Long Beach, Calif. Contractor was Johnson-Western Constructors of San Pedro, Calif.

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David Beck

Beck's Big Dilemma

ILA-Teamster pact draws AFL-CIO fire as union leaders meet in Honolulu

Top brass of the teamsters union, whose power is felt in every industry in the nation, have gathered in Honolulu this week to check their compass—and perhaps to reset it.

The hottest issue before them is controversial mutual-assistance pact between the teamsters' Central, Eastern and Southern Conferences and the outcast International Longshoremen's Association, negotiated last year by the teamsters' ubiquitous Jimmy Hoffa to further the union's power in the East and Gulf Coast ports (ENR Mar. 8, p. 146). AFL-CIO President George Meany has virtually threatened to oust the teamsters if they proceed with the alliance, which calls for a $400,000 loan to the ILA.

Last week, Dave Beck, the teamsters' boss, indicated he'd leave the decision up to his executive board but would fight an AFL-CIO ouster in court. He's reportedly against the loan as a business proposition because most of the proceeds would go to John L. Lewis' United Mine Workers. Despite the dynamic drive of Hoffa, it looked as if the alliance might be killed.

Now claiming 1,300,000 members, the sprawling union is the biggest of the AFL-CIO affiliates and asserts almost unlimited jurisdiction. On this score, it holds one of the keys to success or failure of the pending AFL-CIO membership drive—one of the major objectives of unity itself. Inside the federation, the teamsters' strength is reflected in Beck's position: vice president of AFL-CIO building trades. Hoffa, ninth vice president of the teamsters and president of the Central Conference, is a member of the newly appointed AFL-CIO Building Trades-Industrial Union Department Committee, now scheduled to meet on April 23 to seek a solution to the existing conflict over industrial construction.

The impact of the issue on the internal affairs of the union is almost as dramatic. The battle over control of the teamsters' Joint Council in New York has already moved into court.

Last week, the parent union certified Hoffa-backed John O'Rourke as winner of the hotly contested presidential election. Incumbent Martin Lacey, charging fraud and collusion with racketeers, promptly asked for an injunction to keep O'Rourke out. Even if the court doesn't seriously clip the wings of Hoffa it's bound to lift the lid a little higher off the boiling pot.

Meanwhile, teamster locals in other areas are beginning to voice demands for restoration of local autonomy and an end to the centralization of power that has given the teamsters—and Beck and Hoffa—the strength they have today. Tied into this are the future roles of the union's four regional conferences, its 15 trade divisions and area-wide bargaining on a grand scale. Even after the ILA issue itself is settled, these problems will continue to haunt the union's executive board.

Prevailing Wages

ARBA opposes extension of Davis-Bacon to roads

The American Road Builders' Association has reaffirmed its opposition to putting prevailing wage requirements in the federal highway proposals now before Congress.

Meeting in Washington, D. C., earlier this month, representatives of contractor organizations affiliated with ARBA in twenty states unanimously approved the position previously taken by ARBA before both the Roads and Public Works Committees of the House of Representatives.

The issue has attracted increasing interest in recent weeks. It was high on the agenda of the Second Legislative Conference of the AFL-CIO building trades, which favor its inclusion (ENR, Mar. 15, p. 129). And it has been vigorously opposed by the AGC (ENR, Mar. 22, p. 21).

ARBA takes the position that federal determination of prevailing wages under the federal highway program "would be contrary to forty years of legislative experience in granting federal aid to the states for roadbuilding, such matters having traditionally been left with the states for determination."

According to ARBA President J. N. Robertson, the association has always supported reservation of this authority and responsibility to the states. In his testimony before the Public Works Committee, Robertson said that despite financial assistance from the federal government, "the initiation of projects and responsibility of construction is a state prerogative."

ARBA contends that federal determination of prevailing wages for federal aid work would be detrimental for four reasons:

1. It would increase administrative expenditures.
2. Collective bargaining rights would be abridged.
3. The principle of states' rights would be violated.
4. Construction costs would be increased.

Labor briefs . . .

• **Licenses for contractors**—In Youngstown, Ohio, the building trades and Mahoning County contractors have asked the City Council to require the licensing of contractors. Aimed at financial irresponsibility and inferior workmanship, the proposed ordinance seeks to maintain the standards of the industry.

• **Minimum wages**—The Delaware State Board of Education has said "no" to the Allise Construction Industries of Delaware on its request to put school construction in one of the counties under minimum wage scales. The problem: competitive inequality between local, union contractors and outside, nonunion groups.

• **Alaskan rates**—Five of Alaska's building trades—operating engineers, iron workers, plasterers and bricklayers, cement masons and lathers have received a 5% wage increase. To eliminate existing differentials, southeastern laborers and teamsters were granted an additional 7 cents, and laborers in low classifications another 2½ cents.

OFFICIAL PROPOSALS

Bids: April 11, 1956

Power Authority of the State of New York

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FOR
CHANNEL IMPROVEMENTS
POINT THREE POINTS, LEISHMAN'S POINT AND OGDEN ISLAND
NEAR WADDINGTON, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATIONS NO. PA-5-11008
ST. LAWRENCE CONTRACT NO. 27

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Channel Improvements at Point Three Points, Leishman's Point and Ogden Island near Waddington, St. Lawrence County, New York, in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A.M. Eastern Standard Time on the 11th day of April, 1956, 270 Broadway, Hearing Room C on the 6th floor, New York, New York.

(2) If mailed in until 10:15 A.M. Eastern Standard Time on the 11th day of April, 1956, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The principal items of work are estimated to be up to:

10,570,000 cu. yds.	Excavation, common
250,000 cu. yds.	Excavation, rock
80,000 cu. yds.	Riprap
360,000 cu. yds.	Stripping topsoil from spoil and embankment areas
400 acres	Seeded topsoil
80 acres	Seeding
and	

Constructing sewage facilities for the village of Waddington.

The work shall be completed on or before September 1, 1958.

Plans, specifications and Proposed Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set and Five ($5.00) dollars per set for additional sets, no part of which will be refunded.

Bids will not be restricted to American contractors. Dredges and other marine plant shall be registered and built in the United States.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

Bids: May 1, 1956

Contract MH-52-A

ADVERTISEMENT
CONVENTION-EXHIBIT BUILDING—
SUBSTRUCTURE
MEMORIAL HALL COMMISSION
CITY OF DETROIT, MICHIGAN

Sealed proposals for the construction of the Substructure of the Convention-Exhibit Building, located in the Civic Center of Detroit, addressed to the Office of the City Engineer, 528 City-County Building, Detroit 26, Michigan, will be received until 2:00 P.M. E.S.T., May 1, 1956, and then at such place and time be publicly opened and read aloud.

The work includes excavation, caissons and/or piles, concrete caps and girders, cooling water flumes and wet well, reinforced concrete roadway etc.

The Bidding Documents may be examined during working hours at the offices of Giffels & Vallet, Inc., L. Rossetti, Associated Engineers and Architects, 1600 Marquette Building, Detroit 26, Michigan, and at the office of The Detroit Builders and Traders Exchange and of the F. W. Dodge Corp. of Detroit. The documents may be obtained from the Engineers and Architects upon a deposit of $50.00 per set, which deposit will be refunded upon the return of the bidding documents in good condition within ten days after the date for the opening of bids. Complete sets only will be issued.

Each proposal must be accompanied by a certified check, bank draft, or a satisfactory bid bond in an amount of not less than 5% of the total bid price, as a guarantee and security for the acceptance of the Contract.

All checks shall be payable to the Treasurer, City of Detroit.

No proposal once submitted may be withdrawn for at least 45 days after the actual opening of the bids. The City of Detroit reserves the right to waive any irregularity in any bid, or to reject any or all bids should it be deemed for its best interest to do so.

CITY OF DETROIT
FRANK G. SCHEMANSKE
President, Memorial Hall Commission

Bids: April 12, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

PAINTING THE BENJAMIN FRANKLIN BRIDGE OVER THE DELAWARE RIVER CONNECTING PHILADELPHIA, PENNSYLVANIA AND CAMDEN, NEW JERSEY—CONTRACT NO. 30-F

Sealed bids will be received for Painting the Benjamin Franklin Bridge over the Delaware River connecting Philadelphia, Pennsylvania, and Camden, New Jersey, known as Contract No. 30-F at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:30 P.M. Eastern Standard Time, April 12, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $20,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
Joseph K. Costello, Executive Director

Bids: April 12, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

ROADWAY LIGHTING AND ELECTRICAL WORK—
PHILADELPHIA APPROACHES
WALT WHITMAN BRIDGE CONTRACT NO. P-8

Sealed bids will be received for Roadway Lighting and Electrical Work, Philadelphia Approaches of the Walt Whitman Bridge, known as Contract No. P-8, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Standard Time, April 12, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $25,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: April 12, 1956

Delaware River Port Authority Administration Building Camden, New Jersey

ROADWAY LIGHTING AND ELECTRICAL WORK—
GLOUCESTER APPROACHES
WALT WHITMAN BRIDGE CONTRACT NO. G-8

Sealed bids will be received for Roadway Lighting and Electrical Work, Gloucester Approaches of the Walt Whitman Bridge, known as Contract No. G-8, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Standard Time, April 12, 1956, at which time and place they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $25,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

OFFICIAL PROPOSAL

RATE: $2.10 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: April 12, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 12th day of April 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT 2, L. KETCHUM, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Madison	FASS 56-9	Stockbridge Falls-Merrillsville, Ft. 2 Proj. S360(2)	2.43	Graded Gravel Bit. Surf. Treat.; 3 Brs. Twin Conc. Boxes 28', 30' & 32'	$15,000 Plans $15	$260,000
Montgomery	MT 56-1	New York State Thruway—Mohawk Section—Sub. 12C (Canoga Creek-Fort Plain)	—	Drainage Basin with Slide Gate and Misc. Work	$300 Plans $10	5,500
DISTRICT 3, WM. ROBINSON, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Onondaga	FARC 56-97 FGRC 56-98	Baldwinsville-Cold Spring, S. H. 671 Cold Spring-Liverpool, S.H. 670 Proj. Nos. S405(2); S6405(3)	1.06	Asp. Conc. Opt. 1 Br. Deck Plate Girder 500'; 1 RR Sep. Comp. I-Beam 104.5'	$85,000 Plans $25	1,470,000
DISTRICT 4, B. F. PERRY, Acting District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FARC 56-88	Pittsford-Palmyra, Pt. 1 & Pt. 2, S.H. 766-767 Proj. No. F744(6)	7.23	Asp. Conc. Opt.=7.07 Mi.; Fdtn. Crse. Grav.=0.16 Mi., Repair to Canal Br. No. 2	$50,000 Plans $25	864,000
DISTRICT 5, E. G. H. VOENGMANN, District Engineer, 65 Court Street, Buffalo, N. Y.						
Cattaraugus	FAC 56-16 FARC 56-79	City of Olean: South Union Street Olean-Knapp Creek, Ft. 1, S.H. 9092 Proj. S391(1)	3.21	Asp. Conc. Opt.=3.15 Mi. Misc. Work=0.06 Mi.	$42,000 Plans $15	723,000
DISTRICT 6, J. H. THOMAS, District Engineer, 30 W. Main Street, Hornell, N. Y.						
Tioga	FARC 56-83	Spencer-Candor, Pt. 1 & Pt. 2, S.H. 845-1079 Owego-Candor, Pt. 2, S.H. 5471 Proj. S730(3)	4.49	Asp. Conc. Opt.=4.44 Mi. Misc. Work=0.05 Mi.	$57,000 Plans $15	955,000
DISTRICT 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Dutchess, Putnam and Westchester	TSP RC56-2	Taconic State Parkway: Westchester County Section, Sections 2, 3 and 4	0.40	Asp. Conc. Opt.=0.15 Mi. Misc. Work=0.25 Mi.	$3,200 Plans $10	57,000
DISTRICT 9, F. J. Weber, Acting District Engineer, 71 Frederick Street, Binghamton, N. Y.						
Broome and Chenango	FARC 56-93 FAS SH56-14	Whitney Point-Greene, Pts. 1 & 2, Hy. No. 206-1-1 and 206-2-1; Whitney Point-Greene, Pts. 1A and 2A, S.H. 8489-9243 Proj. S419(1)	10.84	Bit. Mac. Type 1	$100,000 Plans $25	1,803,000
Sullivan	FARC 56-8P	Bloomingburg-Monticello, Pt. 2, S.H. 5457 Bloomingburg-Monticello, Pt. 1, S.H. 5510-5510A Proj. F495(10)	8.39 (1.54 Acc.)	9" Cem. Conc. Pavt., 50'-62' Wide=8.39 Mi.; Cem. Conc. Pavt. (Acc.)=1.42 Mi.; Asp. Conc. Opt.=0.12 Mi.; R.C. Closed Box Hy. Sep. 31'	$160,000 Plans $50	2,912,000
Sullivan	FARC 56-78	Fosterdale-Mongaup Valley, S.H. 986 Monticello-Mongaup Valley, S.H. 890 Proj. S194(2)	7.66	Asp. Conc. Opt. Twin Corr. Plate Pipe Arch 28.5'	$80,000 Plans $25	$1,438,000
DISTRICT 10, M. E. GOLL, District Engineer, Montauk Highway at Little East Neck Road, Babylon, N. I., N. Y.						
Kings	FA BQE56-3	Brooklyn-Queens Expressway Contract No. 16e Demolition—Proj. U1066(9)	0.52	Demolition	$2,500 Plans $10	47,000
Kings	FA BQE56-2	Brooklyn-Queens Expressway Contract 6B Proj. U1066(17)	0.82	9" Cem. Conc. Pavt. with Carbon Black, 2 at 36' Wide =0.27 Mi.; Lighting, Signs & Misc. Work=0.55 Mi.; 6 Hy. Sept. Beams 48.3', 44.6', 48.2', 48.2', 111.1' and 97.1'; 2 Hy. Seps. I-Beams & Girders, 90.5' and 93.2'	$965,000 Plans $100	2,930,000
Kings	FA BQE56-1	Brooklyn-Queens Expressway Contract 7B Proj. U1066(16)	0.46 (1.03 Acc.)	9" Cem. Conc. Pavt. with Carbon Black, 2 at 36' Wide =0.33 Mi.; Cem. Conc. Pavt.=0.25 Mi.; Sheet Asph. Pavt. (Service Rds.)=0.81 Mi.; Misc. Work=0.10 Mi.; 4 Hy. Seps. I-Beams 104.4', 104.4', 98.3' and 92.6'	$160,000 Plans $100	2,894,000
Nassau	FA HHE 56-4	Horace Harding Expressway Extension Contract No. 2 Proj. U862(7)	3.32 (5.86 Acc.)	9" Reinf. Cem. Conc. Pavt., 2 at 36' Wide=2.84 Mi.; Asp. Conc. Opt.=5.86 Mi. Drainage & Demolition 0.48 Mi.; 2 Hy. Seps. Reinf. Conc. Rigid Frame, 97.5' and 101'; 1 Hy. Sep. Girder 62'	$320,000 Plans $50	5,812,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "STATE OF NEW YORK, COMMISSIONER OF TAXATION AND FINANCE" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

John W. Johnson
Supt. of Public Works

Bids: April 3, 1956

Contracts 444 and 447

CONTRACT 444—ELECTRIC SUBSTATION AND ELECTRICAL CONTROL EQUIPMENT
CONTRACT 447—CHLORINATING EQUIPMENT

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A. M., Eastern Standard Time, on Tuesday, April 3, 1956, for each of Contracts 444 and 447, as follows:

CONTRACT 444, for furnishing, testing and delivering a 150-Kva. outdoor unit substation and electrical control equipment for the Margaretville-Arkville sewage treatment plant.

CONTRACT 447, for furnishing, testing and delivering chlorinating equipment for the Margaretville-Arkville sewage treatment plant.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., of each of the two contracts can be obtained in the Chief Clerk's office, Room 1317, at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. For further particulars apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: April 12, 1956

Contract O & M 354

ADVERTISEMENT
NEWARK AIRPORT
FENCING & CURBING
PROPOSAL NO. 783

Sealed proposals for furnishing and installing fencing and curbing at Newark Airport will be received at the office of the Director of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, N. Y., until 11 A.M. on Thursday, April 12, 1956, at which time and place said proposals will be opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase and Administrative Services.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

OFFICIAL PROPOSALS

Bids: April 12, 1956

Delaware River Port Authority
Administration Building
Camden, New Jersey

BROADWAY PAVING AND DRAINAGE
VARE AVENUE TO FRONT STREET IN
PHILADELPHIA, PA.
WALT WHITMAN BRIDGE CONTRACT
NO. P-9

Sealed bids will be received for Roadway Paving and Drainage Vare Avenue to Front Street in Philadelphia, Pa. of the Walt Whitman Bridge, known as Contract No. P-9, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M., Eastern Standard Time, April 12, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $100,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: April 12, 1956

Delaware River Port Authority
Administration Building
Camden, New Jersey

PAVING, GRADING AND DRAINAGE
FROM THE NORTH-SOUTH FREEWAY
TO BLACK HORSE PIKE AND MISCEL-
LANEOUS ITEMS
WALT WHITMAN BRIDGE CONTRACT
NO. G-6

Sealed bids will be received for "Paving, Grading and Drainage from the North-South Freeway to Black Horse Pike and Miscellaneous Items" for the Walt Whitman Bridge, known as Contract No. G-6 at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Standard Time, April 12, 1956 at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $40,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: April 24, 1956

Fairfax County, Virginia
Integrated Sewerage System

(Advertisement for Bids)

Sealed bids will be received at the office of the Sanitary Engineer, County of Fairfax, Virginia until Tuesday, April 24, 1956 at 2:00 P.M., EST for the construction of Contract No. 73: A Sanitary Sewer Line Pumping Station with two stage pumping units, original capacity 7 MGD to be expanded to 11 MGD. Plans and contract documents may be examined and copies thereof obtained at the office of the Sanitary Engineer, upon payment of $10.00 per set, which shall not be returnable. Checks should be made payable to DIRECTOR OF FINANCE.

Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered. Each bid must be accompanied by cash, certified check, or by an acceptable bidder's bond in an amount not less than 5% of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price. No bid may be withdrawn for a period of 30 days after the opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

Harry L. Hale
Sanitary Engineer

Dated: March 21, 1956

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Civil Engineer—$5,178 to $6,326 yearly. In Hydrology Division of Water Resources Commission. Completes field studies concerning water use and water conditions on a statewide, river basin, regional or local basis, such studies to include the gathering and tabulation of hydrologic data from all sources. Analysis of such data for preparation of flood and drought frequencies, back water curves, flow-duration curves, mass diagrams, and other related hydrologic studies. Makes field investigations of problems dealing with beach erosion, ground water pollution, floods, drainage and sedimentation. Write Michigan Civil Service, Lansing 13, Michigan.

Engineers experienced in water and sewage works projects or related fields. Opportunity for permanent connection with long established consulting firm. Please state full qualifications, experience, references and salary requirements. Location Ohio. P-9548, Engineering News-Record.

City Engineer's Assistant—For general municipal engineering and administration, salary dependent upon qualifications, state experiences and apply to Service Director, City Building, Mansfield, Ohio.

Apprentice Trainees for construction analyses and appraisals. Recent graduates, non-smokers, male or female. Apply or send resume and references to Construction Survey Co., 101 Park Avenue, N. Y. 17.

Wanted—Building superintendents, estimators carpenter superintendents & general foreman. Excellent opportunities and starting salary. J. L. Simmons Company, Inc., 506 South Wabash Avenue, Chicago 5, Illinois. Webster 9-2355.

Designers & Draftsmen—structural, mechanical & electrical. For work on industrial buildings & power plants. Long range program, top salaries, advancement & vacations. Marbarry Corp., 140 Nassau St., N.Y.C. COrtlandt 7-0322.

Construction Supt. Required top-notch man for bridge supt., capable of handling both large & small structures. Should have administrative ability to handle multiple unit projects. Location: North Western Ohio. P-1083, Engineering News-Record.

Experienced building estimator with Mid-western contractor specializing in industrial, commercial and public works. Furnish experience record, references, salary desired and photograph, if available. Permanent job. P-1093, Engineering News-Record.

POSITIONS VACANT

Construction Supt. capable of operating multi-million dollar building projects. Experience on industrial, commercial and institutional buildings required. Kindly submit work history and references, stating specific buildings you have constructed, their approximate value, and type of construction. Also state age and marital status. Enclose recent photograph if possible. Interview will be arranged & salary discussed, if application warrants. Location: North Western Ohio. P-1080, Engineering News-Record.

General Superintendent—who is now super-intendent engineer and wants to take next step up with growing N. J. Organization. P-1105, Engineering News-Record.

The Canon City Metropolitan Sanitation Dis-trict, Canon City, Colorado, wishes to contact qualified, experienced and competent sewage treatment plant operator of a new sewage disposal plant. The plant will be completed by late fall or early winter, operator's services begin in early summer, during construction of plant. Address all communications to: Geo. A. Wadleigh, Secretary Canon City Metropolitan Sanitation District P. O. Box 150 Canon City, Colorado.

2 Structural detailers wanted, with checking exp., for expanding organization. Top rate and overtime for experienced men, liberal benefits. S. Kuchma Co. 2555 Dorr St., Toledo 7, Ohio.

Wanted building construction superintendent and assistant. Good opportunity for the right man. Send resume of experience to P-1094, Engineering News-Record.

Engineers: Experienced highway, bridge, drainage, design, draftsman and other positions available. Submit complete resume. Interview will be arranged. Reply P-1174, Engineering News Record, 520 N. Michigan Ave., Chicago 11, Illinois.

Civil Engineers—Two desired immediately by the City of Birmingham, excellent opportunity, work varied and interesting. Starting salary $4966 per year., 40-hr. week and liberal vacation, sick leave, holiday, group insurance, and retirement benefits. Must be college graduate in civil engineering; experience desirable but not necessary. Submit complete written application to Asst. City Manager, Birmingham, Michigan.

Sanitary Engineer (registered, professional) requirements, degree in sanitary engineering and public health experience. $520. per month and travel expenses. Contact Merit System Supervisor, Ky. State Department of Health, 620 S. 3rd, Louisville, Ky.

Structural Detailers. Some experience re-quired. Write H. Hunt, 5050 Joy Road, Detroit 4, Michigan.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered

Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED —**RATES**— **UNDISPLAYED**

The advertising rate is $28.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS to ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y. for April 12th issue closing April 2nd

civil engineers

Large New York engineering firm has responsible established position open for civil engineers. Field experience required on heavy construction such as power plants, industrial projects, dams, and tunneling. Ability to plan and supervise work is necessary. Please include complete experience record with your reply.

P-1189, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

STRUCTURAL ENGINEER

Opportunity for structural engineer with 10 to 15 years structural design, detailing and checking experience on bridges and buildings. Vacancy in position as structural checker; salary open. Must be thoroughly familiar with shop details, concrete details, construction practice and engineering drawings.

Send experience history, references, statement of availability and salary requirements in first letter.

Patchen and Zimmerman, Engineers
Augusta, Georgia

ENGINEERS

CIVIL
MECHANICAL
INDUSTRIAL
ELECTRICAL

Graduates to age 35 for production assignments leading to supervisory positions with progressive expanding company engaged in steel mill service work utilizing heavy construction equipment. Top starting salary and excellent benefit program.

Send complete resume of personal background and experience to

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Openings for young civil and electrical engineers interested in training for estimating or cost engineering positions. Some field experience desirable on heavy construction such as thermo or hydroelectric plants and industrial plants. These are staff positions with a long-established engineering and construction company. Excellent opportunities for advancement.

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P-1188 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

field engineers

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Staff positions open for engineers with field experience in responsible capacity on Hydroelectric projects.

Submit resume of experience, education and personal data to:

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330 W. 42 St., New York 36, N. Y.

CIVIL ENGINEERS

Young civil engineers with MS in Hydraulics. Knowledge of model tests (spillways) and preferably some experience in design of hydraulic structures to assist in design work. Please send resume to

H. O. Niemi, Personnel Manager
HARZA ENGINEERING COMPANY
400 West Madison Street Chicago 6, Illinois

CONSTRUCTION MANAGER

Complete industrial plant project with buildings, facilities, utilities, etc. West Indies. Some foreign experience desirable. Submit full resume, education, experience, references.

P-1195, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED
DIRECTOR OF PUBLIC WORKS
AND CIVIL ENGINEER

Yuba City, Calif. (pop. 10,291) invites applications from California registered civil engineers. Closing date April 15, 1956. Request application forms and complete information from F. K. Dawson, City Administrator, City Hall, Yuba City, California

POSITIONS VACANT

(Continued from opposite page)

Civil Engineer—$5178 to $6326. Chief of survey party. Might include surveys on buildings, remodeling the building, wild life flooding projects, and dams. All Michigan Civil Service benefits. Apply Michigan Department of Conservation, Mr. L. N. Jones, Engineering and Architecture Section, Mason Building, Lansing, Michigan.

Small company in North Branch, N. J. requires young man or woman for general drafting work. Several years experience with fabricated metal desirable but not necessary. Pleasant surroundings and congenial working conditions. Phone Randolph 5-3232, Extension 8.

Florida Consulting Engineering firm needs experienced Mechanical, Electrical and Civil Engineers and Draftsman for permanent positions to do Industrial and Commercial design projects. Give outline of experience, references, available date and starting salary. de Laureal & Moses, Inc., 7 W. Intendencia Street, Pensacola, Florida.

Two college teachers to teach mechanics and or civil engineering subjects other than structural. Salary and rank dependent on qualifications. Location Northern New York. P-1137, Engineering News-Record.

Paving Superintendent complete knowledge asphalt paving and road construction including utilities. Take complete charge of all field operation. Steady employment with established North Jersey contractor. Send resume to P-1192, Engineering News-Record.

Engineering graduates with experience in the testing and control of placement of soils, concrete and asphalt mixtures for work immediately abroad and in New England for an engineering organization of sixty years in business. Give full details of experience and education. Salary range $5,000 to $10,000.00 per year. P-9305, Engineering News-Record.

EMPLOYMENT AGENCIES

Wanted Engineers, Designers, Draftsmen-Structural, Architectural, M.E., C.E., E.E. and Ind., also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

Treasurer Controller—Over twelve years senior administrant of consulting engineering and construction contracting acctg. high level experience includes financing, insurance, job costs, taxes & claims. Proficient in the preparation of concise reports. PW-9410, Engineering News-Record.

(Continued on page 88)

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MECHANICAL —
Design experience in one or more of the following fields:
Instrumentation and controls for Industrial Equipment, Refinery and Chemical Plant Processes, Steam Power Plants, Materials Handling Equipment, Metallurgical Process Equipment such as metallurgical furnaces, kilns, crushers, or related heavy machinery, heating and ventilating, or industrial plant layout.

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Permanent openings in our St. Louis and San Francisco offices for qualified personnel experienced in design of structural steel and reinforced concrete for work on

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Must have a minimum of 3 years responsible structural design experience.

Write in complete confidence to

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Electrical, Mechanical, Soils, & Architectural

Excellent Salaries

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INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

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RW-1187, Engineering News-Record
330 W. 42 St. New York 36, N. Y.

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Qualified Sanitary Engineer with a minimum of 10 years experience in treatment plant operation and management and industrial waste problems. Must be prepared to assume responsibility over entire sewerage system (25 MGD). Submit resume of qualifications, salary requirements and earliest date available.

P-1113, Engineering News-Record
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Permanent Position For Qualified Men

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Phone or Write
Chief Engineer for interview

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Excellent working conditions. Job security with ample opportunity for advancement. Voluntary employee benefit and retirement plan, generous annual leave and sick leave, Blue Cross, paid holidays.

Send full resume, salary desired and references to

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2300 Chester Avenue
Cleveland 1, Ohio

EMPLOYMENT OPPORTUNITIES

POSITIONS WANTED

(Continued from page 85)

Executive Civil Engineer, project manager, over 20 years field and office experience estimating, bid to completion, all types earthwork construction; dams, excavation, dredging. Thoroughly competent to assume full responsibility, domestic or foreign. Write PW-9518, Engineering News-Record.

Construction Executive. Licensed Civil Engineer desires connection in charge of construction department of multi-plant organization. Handle job from design, estimating, contracting to completion. Thoroughly versed in pricing and economics of all types of construction. Some foreign experience, languages. PW-1026, Engineering News-Record.

Construction Engineer, age 34, graduate and registered C.E. Nine years of widely varied field and office experience. Seeking position as Office Engineer with medium size, midwestern construction firm. PW-1101, Engineering News-Record.

Consulting Engr., Chief Engr., Project Mgr., Reg EE-ME. 22 yrs Industry and Railroads, 12 yrs Consulting. Power Plants, Transmission, Distribution, Industrial. $14,000 N. America, $18,000 Central or So. America. 60 days availability. PW-1147, Engineering News-Record.

Registered P.E. and L.S., graduate engineer, age 37. Experienced highways, large scale control and design surveys, subdivision and property work, drainage and flood control. Want associate or partner standing in consulting firm. Opportunity to invest essential. Location Midwest. PW-1146, Eng. News-Record.

Construction Estimator-Graduate Civil Engineer, 30, married, 6 yrs. experience estimating and supervising private and public buildings, schools, churches, etc. Will consider related field if opportunity warrants. PW-1144, Eng. News-Record.

POSITIONS WANTED

Building Construction superintendent: Over 25 yrs. experienc as field supt. on construction of Industrial, commercial institutional bldgs; large scale housing, churches etc. Similar position desired with organization offering long range opportunity. PW-1140, Engineering News-Record.

Registered Engineer, building construction executive, qualified to design, estimate, manage complete project, or manage branch office. Salary bracket $15,000 year. PW-1138, Engineering News-Record.

Construction Manager—25 years experience. Seeks position as manager, superintendent or estimator with building contractor. PW-1158, Engineering News-Record.

Sales Executive—Presently managing sales office in upper N. Y. State. Desires to relocate in Long Island or Metropolitan N. J. Engineering degree, Age 31, married. PW-1159, Engineering News-Record.

Registered Engineer, Electrical, Age 43, available for executive responsibilities with A-E, E-C, or industrial firms. 24 years experience includes 16 years in direction of design construction and maintenance of industrial and commercial facilities. PW-1167, Engineering News-Record.

Site Planner. Reg. P. E. and L. S., B. C. E. Young, capable. Real Estate development work. $10,000 bracket. PW-1166, Engineering News-Record.

Experienced estimator or project manager. Age 46, 24 years experience in construction. Capable of investigating and completely compiling bids for highways, turnpikes, dams and reservoirs. Can also plan, direct all administration and build jobs in their entirety. Best of references. Available April 1st. PW-1198, Engineering News-Record.

POSITIONS WANTED

Assistant sup't: graduate civil engineer. 5 yrs. industrial, commercial, airport construction. Desires position in heavy construction, available immediately. PW-1165, Engineering News-Record.

Harvard Business School graduate. Civil Engineer, 28, desires opportunity with growth organization in contracting, materials supply, manufacturing, real estate development; Great Lakes area. 4 years as estimator & Project Engineer with leading heavy construction firm. PW-1169, Engineering News-Rec.

Registered engineer, 32, available for sales or supervisory work in building industry. Experienced designer-estimator in light construction, will travel, locate in USA or Canada. PW-1172, Engineering News-Record.

Construction Supt: 25 years experience in industrial and commercial building. Prefer work in East. PW-1173, Engineering News-Record.

LT. Civil Engineer Corps, USN, age 30, available July. Desires permanent position with contractor or consultant. B.S., U.S., Naval Academy, B.C.E. and M.C.E. Rensselaer Polytechnic Institute. Broad Engineering experience, excellent administrator. PW-1175, Engineering News-Record.

Building Construction Engineer experienced hospitals, banks, office buildings new and alterations estimates, coordinates sub-contractors, manages office. PW-9511, Engineering News-Record.

Engineer, Mechanical and Structural, graduate with broad experience desires location in Southeast or Midsouth section with engineering or manufacturing company. Supervisory, development, or office engineering preferred. PW-1197, Engineering News-Record.

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Shovel Attachment Sticks, Boom & Bucket Complete for 1½ yd. Machine
ALSO
50 ft. Crane Boom — 1 yd. Clam Bucket for Manitowoc 2000 B
MUST BE IN A-1 CONDITION
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W-1193, Engineering News-Record
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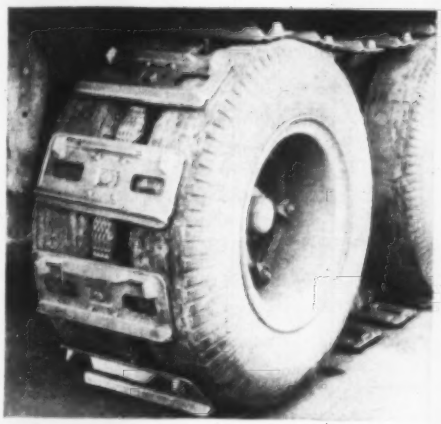

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3000B, 22 ft. boom, 18 ft. stick, 2 Yd. Dipper, Air Controls, 16'-1" Crawlers. Caterpillar D-17000 Diesel Engine. Serial #3005L
New 1954.

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Model TS-300

These machines are in very excellent condition.

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Brand new International Model B170A scraper 16 cu. yds. capacity struck, 21 cu. yds. heaped. Tires.

2—21.00 x 25 20 ply front
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Price new—$18,115.00
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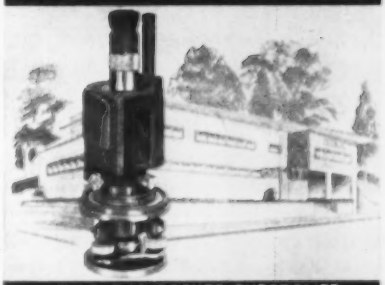

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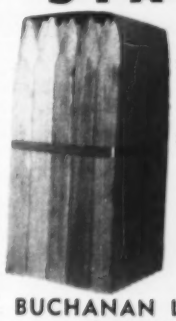

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Editorials

What Is a Tunneling Record, and Why?

DURING THE PAST YEAR three remarkable hard-rock tunnel driving records have been set in three different foreign countries. They raise again the oft-debated question of how a tunneling record is to be measured—in feet advanced per day, in cubic feet removed per day, or in cubic feet per driller per day? Or should the time element be a week or a month? And what about the heights of the tunnels and other relative construction difficulties such as water encountered, or the nature of the rock?

If one attempts to compare and evaluate all the possible differences among tunneling jobs as a basis for declaring a record, the result is apt to seem meaningless and hardly worthwhile. Such a viewpoint, however, should not be tolerated because striving for ever better performance is one of the foundation stones of construction progress, and any benchmark for measuring progress is thus worthwhile, even though it may be debatable. Claims of tunneling records are one of these benchmarks, and should, therefore, always be welcome.

On this basis the three records claimed last year are worthy of review. The comparable data seem to be as follows: (1) On the 24-ft dia Eucumbene Tunnel of Australia's Snowy Mountain hydro project, 12 drillers made an advance of 405 ft in 6 days, or 67½ ft per day; (2) on the North of Scotland Hydro Board's Glen Almond Tunnel, with a 10-ft horseshoe section, 5 drillers made an advance of 557 ft in 7 days, or 80 ft a day; and (3) on the Harresele Tunnel in Sweden, which has a 49 x 59-ft section, 20 drillers made an advance of 157 ft in 7 days, or 22½ ft a day.

The Scotch tunnel thus has the best daily advance, but when cross-section, and therefore rock removed, is taken into account, it falls far behind. Compared to its 72 sq ft area, the Australian tunnel has an area of 450 sq ft and the Swedish tunnel the remarkable area of 1,410 sq ft. Per day, therefore, 30,750 cu ft was removed in Australia, 27,354 cu ft in Sweden and 4,710 cu ft in Scotland.

Considering the number of drillers working in each tunnel, the order is the same: 2,562 cu ft per day per driller in Australia; 1,581 cu ft in Sweden; and 945 cu ft in Scotland.

On the basis of the bare figures, the Australian performance would seem to be the best, and American construction men will take pride in the fact that it is the product of a group of United States contractors. But it should also be noted that the 24 ft height of the Australian tunnel affords very favorable working conditions, whereas the 10 ft height of the Scotch tunnel cramps operations, and the 59 ft height of the Swedish tunnel puts a lot of rock out of easy reach.

The important point is that all of these claims of records are admissable—more excavation in the Australian tunnel, almost as much in the much higher bore in Sweden, and an advance per day in the Scotch tunnel that may be slightly in excess of that reached in the similar size Carlton Tunnel of the Cripple Creek project, present U. S. record holder.

All of these records bespeak the growing efficiency of rock drills, mucking and hauling equipment and of contractor job organization. They set goals for the tunnellers of this year and next to equal or exceed. And they provide an endless opportunity for useful argument and thrilling talk in construction circles around the world. It may be difficult to define a tunneling record, but it is very much worth a try.

Problems Not All Solved

YOUNG ENGINEERS BELIEVE that the power companies and the railroads do not offer attractive opportunities for jobs because most of their engineering problems have been solved. That of course is not the case, but the belief exists according to participants in a panel discussion at a recent meeting of the American Institute of Electrical Engineers.

Engineers who work for the big power companies and the railroads, of course, know how wrong that impression is. No railroad or electric utility, no matter how well established it may be, is without challenging problems for its engineers. As an example, take the problem of how to check the disintegration of concrete in the upstream face of Huntington Lake Dam due to frost action, which was described in ENR Feb. 2, p.33. Railroad maintenance engineers are continually faced with similar problems—and with many new ones that stem from improvements in methods and equipment. Most of them are not spectacular, but finding a proper solution calls for real engineering ability. And the advent of atomic power may even add the spectacular quality.

If the electric utilities and the railroads are to get the young engineers they need, they will have to do a better selling job. This, in fact, has already been recognized by the railroads, as was evidenced at the recent meeting of the American Railway Engineering Association (ENR March 22, p.26).

Their attack is being made on three fronts: First, pay on a par with that offered by other private industry; second, by insuring that ample opportunity for advancement and for interesting work exists; third, by both active recruitment, and by making available information on the opportunities for young men in this field.

These are, indeed, the important steps. With adequate pay as a base, and a story of interesting and worthwhile engineering problems to be solved, the railroads and electric utilities should greatly reduce their recruitment difficulties.

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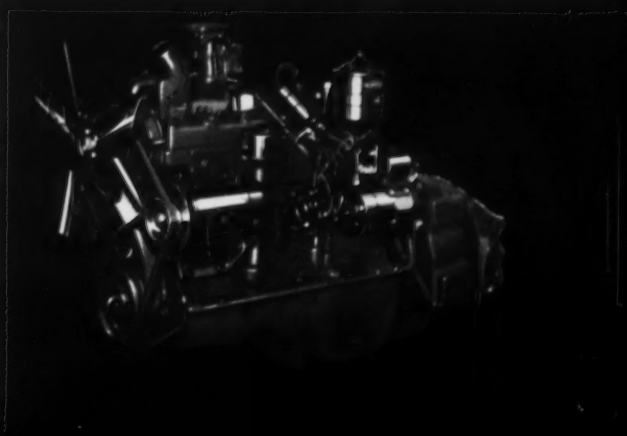

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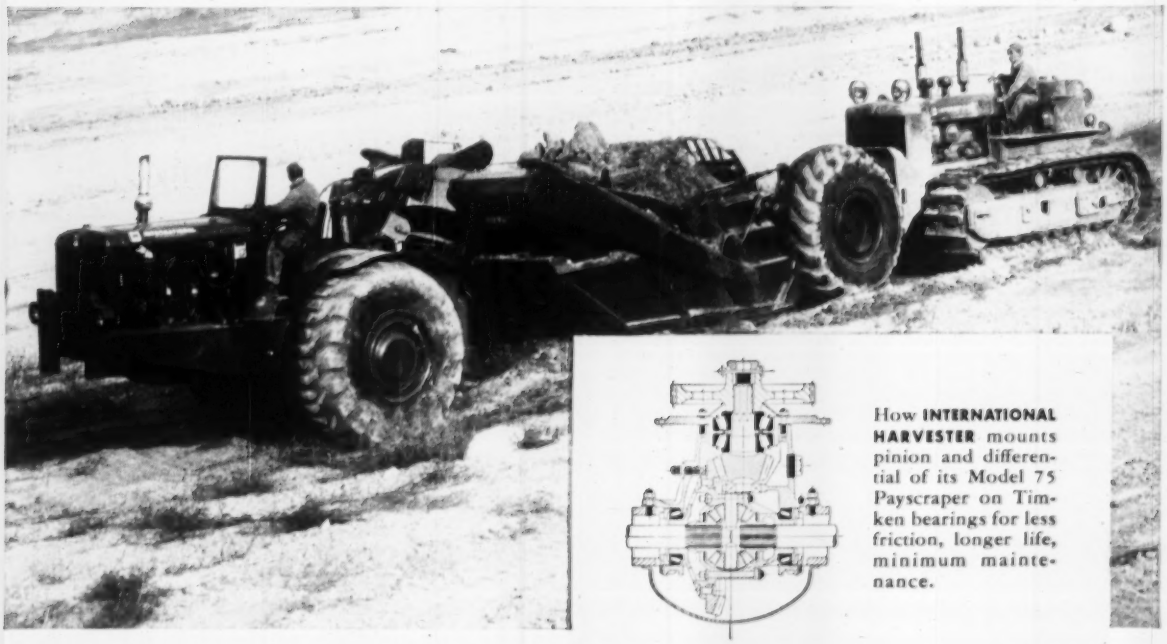

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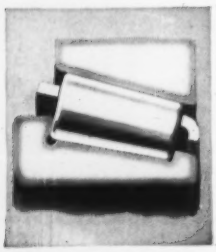

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